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The Paradox of Fiction Revisited:
A Cognitive Approach to Understanding (Cinematic) Emotion

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CONTENTS

ABSTRACT

The following project is intended as a contribution to the inter-disciplinary enterprise of *cognitive film theory*. Employing a cognitive approach, the project examines our capacity to respond emotionally to audiovisual fictions in general and cinematic fictions in particular. In order to structure and focus the investigation, the project centres on the *paradox of fiction*: namely, the question of why and how we respond emotionally to fictional characters and events, especially when we are consciously aware of their fictional - i.e., non-existent - status. (It also considers the related paradoxes of representation and empathy.) The main strategy for solving the paradox is to challenge the proposition that (cinematic) emotions require 'existence beliefs'; in turn, this strategy can be divided into 'direct' and 'indirect approaches', as exemplified by the 'seeing' and 'thought theories' respectively. An additional strategy is to revise the Cartesian framework which underlies the paradox as a whole.

The first three main chapters explicitly address the direct approach. The process of direct engagement can be divided roughly into a 'seeing stage' and a 'reacting stage'. In light of this, Chapter 2 outlines a modular and computational view of the mind/brain, considering some of the ways in which we 'see' the world and the cinema. In a corresponding fashion, Chapter 3 outlines a multi-level model of the emotion system from a neurobiological perspective, considering some of the ways in which we 'react' to what we see. The function of Chapter 4 is to develop the multi-level model in question by adopting a connectionist and cognitive perspective, thereby tracing both an associative network and a cognitive appraisal route to (cinematic) emotion. The final main chapter - Chapter 5 - explicitly addresses the indirect approach. Given that appeals to 'thought' and 'imagination' are potentially problematic, it re-traces the simulative route to (cinematic) emotion, demonstrating how the multi-level model acts as both a constraint on, and an alternative to, emotional simulation.

ACKNOWLEDGEMENTS

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For the years 2000 to 2003, I was fortunate enough to receive a full-time award for doctoral study from the Arts and Humanities Research Board. I am grateful to the AHRB for paying my tuition fees, and for providing me with both a maintenance grant and an overseas conference allowance.

For the duration of my doctoral study, I have been based at the University of Kent. I would like to thank Prof. Murray Smith in the Department of Film Studies for supervision and guidance over the four years, and for providing me with detailed and useful feedback on all aspects of the thesis. I would also like to thank Dr. Alan Thomas in the Department of Philosophy for acting as a co-supervisor in my final year and for reading and commenting on the final draft. I am grateful to the three members of my PhD committee: Dr. Sarah Cardwell acted as my internal examiner with respect to the discipline of film; Prof. Gregory Currie from the University of Nottingham and Prof. Ed Tan from the University of Amsterdam acted as my external examiners with respect to the disciplines of philosophy and psychology respectively. I am also grateful to fellow film postgraduate Gary Bettinson for giving me the opportunity to discuss various aspects of my work, and to departmental officer Susan Quarrell for helping me with the printing and binding of the thesis.

Various courses and seminars in the Film Studies and Philosophy departments at Kent have informed aspects of this project. In particular, Murray Smith's MA course on 'Film and Philosophy' triggered my interest in the paradox of fiction, whilst Frank Cioffi's seminars on Wittgenstein (2000) - attended by Colin Radford and others - in conjunction with a Film Symposium on 'Wittgenstein and the Humanities' (2002) - based on the work of Richard Allen and Malcolm Turvey - introduced me to some of the tensions between the humanities and the sciences. In the Department of Psychology, I attended courses on cognitive psychology and cognitive neuroscience (2001 to 2002). Mike Forrester and Dinkar Sharma allowed me to participate in their courses on the 'Psychology of the Image' and 'Cognition and Emotion' (2001 to 2002) respectively. I am also grateful to Howard Bowman from the Centre for Cognitive Neuroscience and Cognitive Systems for his comments on a preliminary version of Chapter 3, and for many interesting discussions about minds, brains, and 'cognitive neural networks'.

During my study, I have taken the opportunity to participate at several international conferences. Thanks to Joseph Anderson and Carl Plantinga for inviting me to present papers at the third and fourth conferences organised by the Center for Cognitive Studies of the Moving Image (University of Pécs, HU, 2001, and Calvin College, MI, 2004). I am grateful to László Tarnay for inviting me to present papers at two conferences organised by the Laterna Magica Association (University of Pécs, 2001 and 2002), and Damien Sutton for inviting me to present a paper as part of a panel at the Screen conference (University of Glasgow, 2002).

In 2003, I undertook a six-month study visit to the University of California, Santa Barbara, where I was based in the Department of Film Studies. I would like to thank Edward Branigan for generously offering to act as my supervisor during my visit and Melinda Szaloky for her hospitality. I am grateful to Mette Kramer for originally encouraging me to venture overseas and for continuing to encourage me in many other aspects of life.

During my visit, I spent much time in the Department of Psychology at UCSB. Thanks to Leda Cosmides and John Tooby at the Center for Evolutionary Psychology for generously giving me their time to answer my questions, for allowing me to participate in a graduate course on evolutionary psychology, and for inviting me to present a paper at their weekly graduate seminar on the same subject. Tim German and Jeff Niehaus willingly discussed various aspects of their work and invited me to present the same paper at a graduate seminar on developmental and evolutionary psychology. I am grateful to Jim Blascovich and Jack Loomis at the Research Center for Virtual Environments and Behavior (ReCVEB) for several illuminating discussions about the relationship between virtual reality and film, for introducing me to the 'threshold model of social influence', and for allowing me to try out a number of 'immersive virtual environments'. I am also grateful to Gregory Ashby for two discussions about the applicability of Joseph's LeDoux work on the neurobiology of emotion to our understanding of film viewing, and to Alan Fridlund for a number of discussions about facial expressions of emotion in film.

Most of all, I would like to thank my mother and father for their constant love and support. It is to them that I dedicate this thesis.

NOTE ON PRESENTATION

Throughout this thesis, I have employed two main strategies which, when considered together, provide an overview of the central arguments. First, a detailed contents page is included at the beginning of each chapter. Each contents page is broken down into sections and sub-sections; each of these breakdowns is intended to reflect the basic structure of the psychological processes being described. Second, substantial use has been made of certain types of visual aid. Regarding the figures, boxological diagrams provide the best way of illustrating certain psychological processes, whilst graphs provide the best way of illustrating either functional or inverse relationships between two or more factors. Tables are used to summarise key points and frame stills to illustrate key moments from the films under discussion. A different numbering system has been employed for each type of visual aid: for example, Figure 1.1, Table 1.1, and Frame 1.1.

CHAPTER 1

Introduction:
Three Paradoxes Revisited

CHAPTER 1

Introduction: Three Paradoxes Revisited

Given the significant role emotion plays in both our everyday lives and our experience of art, historically the subject of emotion has been strangely neglected in both the sciences and the humanities. In the last twenty or so years, however, emotion has become something of a hot topic of research in both philosophy and psychology. And in the last ten or so years, this development has been reflected in film studies by the interdisciplinary enterprise known as *cognitive film theory*.[1] Although the origin of the cognitive approach to film can be traced back to Hugo Münsterberg writing as early as 1916, the cognitive approach was only significantly revived by David Bordwell as recently as 1985. Since then, a small group of theorists have offered cognitivist accounts of *cinematic emotions*: for instance, Noël Carroll (1990) focuses on our reactions of fear and disgust to the proverbial monster in horror films; Ed Tan (1996) argues that our primary emotion when viewing a film is one of 'interest'; whilst Torben Grodal (1997) describes the way in which we emotionally process a film's 'narrative flow'. Most recently, Greg M. Smith (2003) has proposed an 'associative network model' of the film viewer's emotion system.

The following project is intended as a contribution to this particular field of enquiry. Considering the obviously broad nature of the field, I will necessarily narrow my focus to an investigation of a number of inter-related *paradoxes* which seem to arise when we consider our capacity to respond emotionally to both fictions in general, and cinematic fictions in particular. My hope is that by addressing the problematic assumptions which underlie such paradoxes, we may begin to grasp the dynamics of the film viewer's perceptual and emotional relationship to the big screen. The task of this opening chapter, then, is to revisit the paradoxes in question and the solutions which have been proposed

[1] For a recent review of cognitive film theory, see Carl Plantinga (2001).

thus far, before sketching an overview of the type of solution which will be described in the subsequent chapters.

1.1 THE PARADOX OF FICTION

(a) Fiction or non-fiction?

Implicit in the question of *how* we respond emotionally to fictional characters and events is the conundrum of *why* it is that we do so, especially when we are consciously aware of their fictional (i.e., non-existent) status. The conundrum that has come to be known as the *paradox of fiction* is best illustrated by considering the type of thought experiment proposed by Colin Radford (1975) in a much-cited article entitled 'How Can We Be Moved By the Fate of Anna Karenina?':

> Suppose that you have a drink with a man who proceeds to tell you a harrowing story about his sister and you are harrowed. After enjoying your reaction he tells you that he doesn't have a sister, that he has invented the story. In this case ... we might say that the 'heroine' of the account is fictitious. Nonetheless ... once you have been told this you can no longer feel harrowed. (p.68)

Radford's thought experiment has been used to demonstrate that belief in the 'existence' of a person or event is necessary for an emotional response to that person or event; or, to put it another way round, it has been used to demonstrate that emotions require *existence beliefs*. An existence belief is an example of an epistemic mental state or propositional attitude; that is, it consists of a proposition - "the man's sister exists." - and an attitude towards that proposition - "I believe that", which is to be distinguished from "I desire that", "I hope that", and so forth. The problem arises when we engage with the characters and events either described or presented by fictions - say, Leo Tolstoy's 1877 novel *Anna Karenina*, or Clarence Brown's 1935 film adaptation staring Greta Garbo (see Frame 1.1). In such cases, we seem to lack the relevant existence beliefs but nevertheless retain the ability to respond emotionally.

Frame 1.1: The paradox of fiction: *Anna Karenina* (1935)

The paradox of fiction can be spelt out more precisely in terms of three apparently sound propositions which when considered together produce a contradiction (see Table 1.1). Radford himself offers what could be described as an *irrationality theory* of emotional responses to fiction. Significantly, he dismisses 'brute facts' and 'biological reasons' from the very outset, claiming that the issue under discussion is 'conceptual' in nature (ibid., p.67). (As we will see, the distinction between empirical investigation and conceptual analysis is not as clear-cut as it appears.) In total, Radford outlines six possible solutions to the paradox but rejects each of them, concluding that our capacity to respond emotionally to fiction 'involves us in inconsistency and so incoherence' (p.78).

Table 1.1: The paradox of fiction

No.	Proposition
1	We do not believe in the 'existence' of fictional characters and events
2	We are able to respond emotionally to fictional character and events
3	We must believe in the 'existence' of a person or event in order to respond emotionally to that person or event

(b) Challenging the first and second propositions

Having outlined a *non*-solution to the paradox of fiction, how have theorists attempted to find a positive solution (see Table 1.2)? To date, the main strategy has been to argue that at least one of the three propositions is either false or in need of revision. Different theorists have attempted to challenge different propositions; let us give a brief overview of their intellectual endeavour in logical, as opposed to chronological, order.[2]

(i) The illusion theory

The first option is to challenge the *first proposition* of the paradox of fiction. The strong version of the *illusion theory* proposes that we mistakenly believe in the existence of fictional characters and events - that is, we are the subjects of some sort of deception - whilst the weak version proposes that we somehow minimise the effect of our correct belief in their non-existence. Dismissing the strong version on the grounds of implausibility, Carroll (1990) and others attribute the weak version to the poet Samuel Coleridge who, in his 1817 work *Biographia Literaria*, introduced the notion of the 'willing suspension of disbelief'. (From this point onwards, let us refer to 'existence disbeliefs' as *non-existence beliefs*.) Coleridge's phrase has entered our everyday vocabulary; indeed, one could argue that it is the phrase that most readers and viewers offer when asked to explain their apparently contradictory responses to fiction. More surprisingly, perhaps, the phrase continues to be posited as a serious explanation by both psychologists and communications researchers.

(ii) The pretend theory

The second option is to challenge the *second proposition* by replacing real emotions with 'pretend' or 'quasi emotions'. Carroll (ibid.) and others attribute the *pretend theory* to the philosopher Kendall Walton (1978). Walton considers it to be 'a principle of common

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[2] Part of this discussion will inevitably follow Noël Carroll (1990), pp.60-88. For a more recent discussion, see Mette Hjort and Sue Laver (1997), Part 1.

sense' that emotions (for example, fear) require existence beliefs (p.6). In light of this principle, he suggests that when we consume fictions, we engage in a game of *make-believe*: for instance, we pretend to believe that the monster presented by a horror film is real and a genuine threat to ourselves, using the corresponding images and sounds as 'props'. Subsequently, we experience 'pretend fear' or 'quasi-fear sensations' (with physiological and behavioural components).

Is either of these two theories plausible? To begin with Coleridge's illusion theory, the notion of 'suspending our disbelief' merely replaces one type of contradiction, or psychological mystery, with another. As Carroll (ibid., p.67) observes, the notion merely 'relocates the contradiction by moving it back a step'. In the following chapters, I will argue that, if anything, Coleridge got it the wrong way round; our capacity to respond emotionally to fictions involves the '*un*willing *application* of disbelief'. The pretend theory - whether or not it is attributed to Walton - is equally problematic. As Carroll (p.73) argues, the notion of a 'pretend' or 'quasi' emotion 'relegates our emotional responses to fiction to the realm of make-believe'. In the following chapters, I will argue that a straightforward 'either-or' distinction between 'real' and 'quasi emotions' is untenable, our emotional responses to both the real world and the cinema involving many of the same pathways and systems.

(c) Challenging the third proposition

Contrary to both the illusion and the pretend theories, we want to retain the first and second propositions of the paradox of fiction if at all possible: it seems reasonable to say that we do not believe in the existence of fictional characters and events on the one hand, but that our emotional responses to those characters and events are genuine in significant respects on the other. In light of this, one of the most promising lines of enquiry may lie in challenging the *third proposition*: that is, emotions, real or otherwise, do not require existence beliefs after all. For pragmatic purposes, it will be helpful to divide the proposed solutions into what I will classify as *direct* and *indirect approaches*.

(i) The direct approach: the seeing theory

According to the direct approach, we are capable of responding emotionally to the fictional character and events presented by film in a 'direct' fashion; that is, in the absence of (conscious) mental activity. The main example of the direct approach is provided by Malcolm Turvey's (1997) *seeing theory* of emotional responses to fiction. Turvey bases this theory on Ludwig Wittgenstein's (1958) discussion of the verb 'to see' - especially, the notion of 'regarding-as'. Another possible example is provided by Joseph Anderson's (1996) ecological approach to cognitive film theory. Although Anderson does not focus on the paradox of fiction, he bases a large part of his approach on Gibson's (1979) ecological theory - especially, the notions of 'direct perception' and 'affordances'.

(ii) The indirect approach: the thought theory

In contrast, the indirect approach allows for the role of (conscious) mental activity. According to Carroll's (1990) *thought theory*, we do not respond emotionally to the mistaken belief that, say, the monster presented by the horror film actually exists; rather, we respond emotionally to the thought of the monster, where the act of thinking is defined as the capacity to 'entertain a proposition non-assertively' - that is, without existential commitment. Murray Smith (1995b) has advanced a similar theory, arguing that we 'imaginatively entertain' the scenarios presented by fiction film, using the perceptual data in question as a 'prompt'. The thought theory also relates to Gregory Currie's (1995) imagination theory which spells out the imagination in terms of offline simulation.

Both the seeing and thought theories and are on the right lines in attempting to challenge the third proposition: emotions, real or otherwise, do not require existence beliefs. Both theories, though, are in need of development and clarification. As a follower of Wittgenstein's later philosophy, Turvey does not attempt to outline any of the causal processes underlying our perceptual and emotional relationship to film; because of this, he does not do justice to the complexity of the phenomena in question. Similarly, although it is plausible that both thought and imagination play a significant role in our experience of film, we should treat explanatory appeals to such capacities with caution, endeavouring whenever possible to offer explanations in more concrete and literal terms.

Table 1.2: Proposed solutions to the paradox of fiction

target proposition	type of theory		status of theory
1	illusion theory		to be rejected
2	pretend theory		to be rejected
3	direct	seeing theory	to be developed
	indirect	thought theory	to be developed

1.2 THE PARADOX OF REPRESENTATION

(a) Referent or representation?

The paradox of fiction will be the main focus of the subsequent chapters; it will provide the basic framework for our investigation into (cinematic) emotions. It is important to note, however, that the paradox of fiction is closely related to two other paradoxes; significantly, the solutions to the latter may lead us to the solution to the former. The first of these paradoxes exists within the perceptual realm. In Francis Ford Coppola's *The Conversation* (1974), a surveillance expert called Harry Caul (played by Gene Hackman) attempts to decipher a conversation he has secretly recorded between a young couple walking in San Francisco's Union Square (see Frame 1.2).

In an interview about the film, Coppola acknowledges the strangeness of the ritual of film viewing, describing an occasional moment of clarity when one reflects upon the absurdity of sitting in a darkened room and being presented with 'patterns of light and sound'.[3] In a strict sense, a pattern of light and sound which resembles either a middle-aged man listening or a young couple talking has the same ontological status as a pattern of light and sound which resembles absolutely nothing whatsoever. In this respect, responding emotionally to such a pattern turns out to be, in Coppola's words, 'a crazy situation'.

[3] Coppola is interviewed in the featurette 'Close-up on *The Conversation*': directed by Robert Davla and available on the Special Edition DVD of the film.

Frame 1.2: The paradox of representation: *The Conversation* (1974)

In the way that Radford's thought experiment suggests that emotions require existence beliefs, is there an equivalent argument to made for perception (see Table 1.3)? According to Richard Allen (1997), the *causal theory of perception* suggests that we must be in the 'presence' of a person or event in order to perceive that person or event; in other words, perception is subject to some sort of 'presence condition' (as opposed to a 'presence belief'). This is where the *paradox of representation* arises. In the case of viewing *The Conversation*, we are not in the 'presence' of either Caul / Hackman or the event of his eavesdropping, and yet we seem to perceive both Caul / Hackman and his eavesdropping efforts in some meaningful sense. In order to allow for direct comparisons with the paradox of fiction, the paradox of representation can be spelt out, once again, in terms of three apparently sound propositions which when considered together produce a contradiction.

Table 1.3: The paradox of representation

No.	Proposition
1	We are not in the 'presence' of represented characters and events
2	We are able to perceive represented characters and events
3	We must be in the 'presence' of a person or event in order to perceive that person or event

(b) Challenging the third proposition

How have theorists attempted to solve the paradox of representation (see Table 1.4)? Kendall Walton's (1984) *transparency theory* can be regarded as an attempt to challenge the first proposition of the paradox. With respect to those scenes from *The Conversation* which feature Caul / Hackman, Walton would propose that we see 'through' the corresponding representations to the man himself; that is, we are, in some sense, in the 'presence' of an actual person. To my knowledge, no one has attempted to challenge the second proposition: to reiterate, it seems reasonable to say that we perceive Caul / Hackman in some meaningful, if unspecified, sense. Once again, then, the most promising line of enquiry seems to lie in challenging the third proposition; similarly, the proposed solutions can be divided into direct and indirect approaches.

(i) The direct approach: the seeing and recognition theories

As before, the main examples of the direct approach are provided by Turvey's (1997) seeing theory and Anderson's (1996) ecological approach. Before we could react 'directly' to the characters and events of *The Conversation*, we would have to see them in a 'direct' fashion; indeed, both Turvey and Anderson argue from this sort of logical standpoint. Another example is provided by the *recognition theory* - attributed by Allen (ibid.) to Currie (1995). Like Anderson (and unlike Turvey), Currie refers to the underlying causes of perception: if asked about the case in question, he would argue that the image of Caul / Hackman triggers a corresponding 'object-recognition capacity'.

(ii) The indirect approach: the imagination and illusion theories

The indirect approach has two potential candidates. The first candidate is the *imagination theory* - attributed by Allen (ibid.) to Wittgenstein's (1958) notion of 'seeing-as' and Richard Wollheim's (1980) notion of 'seeing-in'. According to this theory, we imagine 'seeing' the image of Caul / Hackman 'as' if were actually in his presence, or, to put it another way, we imagine 'seeing' the actual man 'in' the image. The second candidate is the *illusion theory* - one example being Allen's own (1995) theory of 'projective illusion'.

Illusion theories in general stipulate that when we perceive Caul / Hackman, we are deceived in either a sensory or an epistemic fashion. (My reason for including the illusion theory at this point is that illusions may involve top-down processes of an indirect nature.)

In the following project, both the seeing and recognition theories will be developed by adopting a cognitive approach to be defined below. As Coppola recognizes, the key point is that the patterns of light and sound presented by film are capable of interfacing with the viewer's mind. In contrast, both the imagination and illusion theories will be rejected. Although it is plausible that imagination is involved in the case of emotion, it will be argued that it is not required in the case of perception. Likewise, we are not the unwitting subjects of an illusion: at the sensory level of the mind, talk of deception is inappropriate, whilst at the epistemic level, it is inaccurate.

Table 1.4: Proposed solutions to the paradox of representation

target proposition	type of theory		status of theory
1	transparency theory (?)		to be rejected
2	N/A		N/A
3	direct	seeing theory recognition theory	to be developed
	indirect	imagination theory illusion theory (?)	to be rejected

1.3 THE PARADOX OF EMPATHY

(a) Self or other?

The second relative of the paradox of fiction occupies the emotional realm. Radford takes it for granted that being moved by the fate of a real-life version of the man's sister is not problematic. Even if we imagine that the man's sister really does exist, however, we could still ask the following question: why do we respond emotionally to the situation of another person at all, especially a person we have never met? According to Alex Neill (1996, p.175), empathy is the capacity to *feel with* another person. (Sympathy, on the other hand, is the capacity to *feel for* that person.)

To widen the scope of the discussion, some of the philosophical and psychological literature on empathy cites the real-world example of standing at the foot of a mountain whilst observing a rock climber struggling desperately with an overhang. A filmic counterpart would be viewing Kevin Macdonald's *Touching the Void* (2003), a recent documentary about two British men who successfully climbed a mountain in the Peruvian Andes in 1985, before facing a series of equivalent ordeals on their descent (see Frame 1.3). Why is it plausible that we would respond emotionally to the fate of the anonymous climber in the first instance, or the fate of either Joe Simpson or Simon Yates in the second, as people who exist separately - in physical, kindred, and platonic terms - from ourselves?

Frame 1.3: The paradox of empathy: *Touching the Void* (2003)

The latter questions lead us to the *paradox of empathy*. Here, the paradoxical aspect stems from the somewhat disheartening and misanthropic assumption that only concern for oneself is straightforwardly rational and understandable. This extension of Radford's thought experiment can be used to suggest that belief in the 'self-relevance' of a situation is necessary for an emotional response to that situation; or, to put it another way, emotional responses require *relevance beliefs* (see Table 1.5). Each of the three propositions of the paradox of fiction can be adapted with respect to the paradox of empathy: 'reality-status' can be replaced with 'self-relevance', and 'audiovisual representation' (of another person's situation) can be replaced by 'another person's situation' (period).

Table 1.5: The paradox of empathy

No.	Proposition
1	We do not believe in the 'self-relevance' of other people's situations
2	We are able to respond emotionally to other people's situations
3	We must believe in the 'self-relevance' of a situation in order to respond emotionally to that situation

(b) Challenging the third proposition

How have theorists attempted to solve the paradox of empathy (see Table 1.6)? Certain theories of *altruism* might attempt to challenge the first proposition of the paradox by proposing that we *do* believe in the 'self-relevance' of the rock climber's situation; such a proposal, however, would beg the very question we are asking. To my knowledge, no one has attempted to challenge the second proposition: to reiterate, it seems reasonable to say that we would be able to respond emotionally to the climber's plight. As before, then, the most promising line of enquiry seems to lie in challenging the third proposition; what is more, theorists tend to propose two basic routes to empathy, the first route operating 'directly' and the second 'indirectly'.

(i) The direct approach: the associative route

The direct route to empathy can be described as the *associative route.* In the case of the struggling rock climber, the first possible target for our empathetic response would be the climber himself. The most obvious examples of *personal cues* would be provided by the climber's facial, bodily, and vocal expressions of emotion (fear, pain, distress, and the like). As we will see, these cues would operate either as external stimuli, via classical conditioning, or internal stimuli via affective mimicry and facial feedback. The second possible target for our empathetic response would be the climber's situation: in other words, we might look past the climber to the world around him. The *situational cues* would include the causes of the climber's emotion - namely, the overhang and the stomach-churning drop itself - as well as certain contextual elements. These cues would operate either as external stimuli or by the triggering of associated memories.

(ii) The indirect approach: the simulative route

The indirect route to empathy can be described as the *simulative route.* Traditionally, theorists appeal to the notion of either perspective-taking or role-taking: according to this notion, we 'imaginatively project' ourselves into the climber's situation as if we were actually struggling with the overhang ourselves. Following the recent discussions of *simulation theory* in the philosophy of mind, this imaginative activity can be spelt out in terms of 'mental simulation': viz., we simulate the climber's perceptions, beliefs, and desires, and feed them into the relevant psychological mechanisms, operating in an 'offline' fashion.

In the case of empathy - as in the case of fiction - both the direct and indirect approaches are plausible. In the following chapters, I will attempt to trace the associative route to empathy in greater detail, whilst introducing an appraisive route not described above. Having done this, I will attempt to re-trace the simulative route in terms of the other two.

Table 1.6: Proposed solutions to the paradox of empathy

<table>
<tr><th>target proposition</th><th colspan="2">type of theory</th><th>status of theory</th></tr>
<tr><td>1</td><td colspan="2">altruism (?)</td><td>to be developed</td></tr>
<tr><td>2</td><td colspan="2">N/A</td><td>N/A</td></tr>
<tr><td rowspan="2">3</td><td>direct</td><td>associationism</td><td>to be developed</td></tr>
<tr><td>indirect</td><td>simulation theory</td><td>to be developed</td></tr>
</table>

1.4 TOWARDS A NEW SOLUTION

(a) Methodology

In order to find a solution to the paradox of fiction - and the related paradoxes of representation and empathy - we must begin by considering the issue of methodology. Let us start with general considerations, before moving onto specific ones.

(i) Philosophy and/or science?

Both Colin Radford and the Wittgensteinian theorists seem to make a sharp distinction between two kinds of reality and two kinds of epistemological enterprise. According to this distinction, the spectator's relationship to fiction is an aspect of the human world and the study of this world is the domain of *philosophy*, where the principal method of investigation is defined as 'conceptual clarification'. In this light, philosophers are typically concerned with necessary truths which are expressible as analytic statements, a well-known example being the sentence, 'A bachelor is an unmarried man.' In the case of psychology, philosophers are taken as being concerned with the prescriptive (normative) project of ascertaining whether or not the 'reasons' for our actions are rational and justifiable. Significantly, Radford and colleagues dismiss both the natural world and the domain of *science*, where the principal method of investigation is defined as 'empiricism' (in the form of observation and experiment). In this light, scientists are typically concerned with contingent truths which are expressible as synthetic statements, non-specific examples being Radford's notions of 'brute facts' and 'biological reasons'. In the case of psychology, scientists are taken as being concerned with the descriptive (non-normative) project of ascertaining the 'causes' of our actions.

In contrast, the following project will start from the Realist assumption that there is *one* 'real world' which exists independently of both our experience and our use of language, and that behind the observable domain of objects and events lies the unobservable domain of causal mechanisms (see Roy Bhaskar, 1975).[4] Following a

[4] Outlined by Robert Allen and Douglas Gomery (1985, Ch. 1) in relation to film history. Realism (upper-case R) is not to be confused with the type of realism (lower-case r) espoused by the French film theorist André Bazin.

'naturalized epistemology', the difference between philosophy and science will be regarded as one of *degree*, the two enterprises existing in 'continuity' with one another (see W. V. Quine, 1969). On the one hand, philosophy should be informed by, and consistent with, the empirical discoveries of science, in order to break free from the vicious circle of conceptual clarification and to make new progress on old problems. On the other hand, science should be informed by, and consistent with, the conceptual (or 'theoretical') insights of philosophy, for reality cannot be understood through observation and experiment alone. In the case of psychology, it will be argued that the normative project of justifying the spectator's emotional responses to fiction can be achieved by the non-normative project of describing the underlying causes of those responses.

(ii) Conceptual integration and piecemeal theorizing

The Realist assumption implies that the academic disciplines of philosophy and film studies can have only limited control over the boundaries of their subject-matter. Practitioners can be selective about the types of questions which they address: for instance, it seems entirely reasonable for philosophers to ask "Why do spectators respond emotionally to that which is fictional?", and for film theorists to ask "Why do spectators respond emotionally to film?" Once these questions have been decided and approved, however, the answers are determined by the world itself. Given that the ritual of film viewing comprises both 'humanistic' and 'naturalistic' factors, the segregation of these factors according to academic discipline is arbitrary and not conducive to achieving a complete and deep understanding.

This point leads us to the enterprise of *conceptual integration*. The evolutionary psychologists Leda Cosmides, John Tooby, and Jerome Barkow (1992) argue that the mysteries of one academic discipline can be solved by referring to the theoretical insights and empirical discoveries of another, whilst observing that the communication between disciplines is hindered by institutional barriers. With respect to film studies, conceptual integration is akin to what David Bordwell (1996) and Noël Carroll (1996c) advocate as *piecemeal theorizing*. In opposition to the Grand Theorist's attempts to describe and explain broad aspects of the world - notable examples being (psychoanalytic) subject-position theory and culturalism - Bordwell and Carroll argue that researchers should concentrate on 'middle-level' problems which have both theoretical and empirical dimensions and which require an interdisciplinary approach of the nature described.

(b) Approaches

Having argued the general case for naturalized epistemology and so forth, which specific disciplines should we attempt to 'integrate' and 'piece' together? For pragmatic purposes, the disciplines of relevance to us can be divided into two basic approaches.

(i) A cognitive approach

The main approach can be regarded as an extension of *cognitive film theory*, where the term 'cognitive' is used in a broad sense to refer to any aspect of the spectator's psychology. How, though, should we specifically understand the role of the spectator's mind and brain, and the relationship between the two?

In the beginning, there was *substance dualism* - the Cartesian view that the mind (as a supposedly immaterial substance) and the brain (as a decidedly material one) are distinct entities. The contemporary solution to the problem of how the two are capable of interacting is the *functionalist view* that the mind is 'what the brain does', the 'software' of the mind being implemented on the 'hardware' of the brain. Significantly, however, the mind/brain, software/hardware dichotomy leads to two contrasting positions. The first position is described as the *autonomy of psychology thesis*. Some philosophers (e.g., Jerry Fodor, 1974) argue that our understanding of the mind cannot be illuminated by our understanding of the brain, typically pointing out that the same piece of computer software can be implemented on different kinds of computer hardware. Ironically, this position leads to a type of dualism, albeit 'theory dualism'. The second position comes under the rubric of *neurophilosophy*. Other philosophers (e.g., Patricia Smith Churchland, 1986) propose a 'unified account' of the mind/brain, arguing that the questions of psychology can be informed in significant ways by the findings of neuroscience, and vice versa. At its most radical, this position leads to 'eliminative materialism' - the view that 'folk psychological' mental states such as beliefs and desires do not exist.[5]

In this thesis, I propose to steer a middle course between these two extremes; that is, I wish to acknowledge that some, but not all, aspects of our psychology can be informed by neuroscience, whilst retaining our folk psychological notions of 'belief' and 'desire' when appropriate, especially our notion of a 'non-existence belief'. In total, I will distinguish two basic perspectives on the mind/brain (neurobiological and functional) and four related levels of explanation (corresponding to the disciplines of neurobiology, associationism, cognitivism, and intentionalism).[6]

(1) A neurobiological perspective. In light of the above arguments, a neurobiological approach is required to describe the 'hardware' of the spectator's brain. For the time being, we should note two basic points. First, contrary to popular belief, the brain can be understood in terms of at least two different levels of organization (see Table 1.7). At the *microscopic scale*, the brain is composed of neurons and circuits. Although current brain imagining techniques are capable of detecting the operations of individual neurons, they are not yet capable of disentangling one circuit, or network of neurons, from another. Many sceptics tend to assume that neurobiological explanations refer to microscopic brain structures alone. At the *macroscopic scale*, however, the brain is composed of systems and subsystems. Significantly, brain imaging techniques are capable of detecting, say, the visual system as a whole, and, increasingly, the visual subsystems of which it is composed. Unless stated otherwise, the neurobiological explanations cited in this thesis will refer to macroscopic brain structures.

Table 1.7: Levels of brain organization (for future reference)

	levels of brain organization
(1) microscopic scale **(not detectable *)**	(a) neurons (b) circuits (i.e., networks of neurons) *
(2) macroscopic scale **(detectable)**	(c) subsystems (d) systems

[5] Also see P. M. Churchland (1981) and Stephen Stich (1983).

[6] In a guide to cognitive science intended for a humanities audience, Patrick Hogan (2003, pp.31-34) outlines variants of these four levels of explanation in reverse order.

Second, the brain can be understood in terms of basic neuroanatomy (see Table 1.8). To begin with, we can make a simple two-fold distinction between the 'neocortex' (the six layers which envelope the cerebral hemispheres) and the 'subcortex' (everything which lies beneath) - a distinction which will relate informatively to the 'dual nature' of both real world and filmic experience. Following Paul MacLean's (1990) 'triune', or 'three-in-one', brain theory, the neocortex can be regarded as a brain in its own right - one which is extraordinarily developed in the case of humans - whilst the subcortex can be divided into brains of mammalian and reptilian origin. Each of these brains is associated with a number of key structures which will be referred to at various stages of the thesis.

Table 1.8: Basic neuroanatomy (for future reference)

	triune brain theory	key structures	
(1) neocortex	forebrain ('human')	'new cortex' (neocortex)	frontal - parietal - occipital - temporal -
(2) subcortex	forebrain ('mammalian')	limbic system	'old cortex' (limbic cortex) hippocampus, amygdala BF, BG
		diencephalon	thalamus
	forebrain ('reptilian')		hypothalamus
	midbrain	brain stem	tectum
	hindbrain		pons, medulla; cerebellum

BF = basal forebrain; BG = basal ganglia

(2) A functional perspective. In order to understand how a functional approach describes the 'software' of the spectator's mind, we must identify at least three levels of explanation (see Table 1.9). For pragmatic purposes, we can think of the mind as functioning in two basic ways. *(a) Associationism (connectionism).* The associationist proposes that the mind is made up of either chains or networks of associative connections. Although this view dates back to the seventeenth century and the British Empiricists, it has been recently resurrected in a different guise. Connectionists attempt to model mental processes by building networks which approximate the structures and pathways of the brain; a node in a connectionist network is analogous to a neuron, or a group of neurons, whilst the connection between one node and another is analogous to a synapse. In this respect, functional explanations move towards neurobiological ones, connectionists effectively attempting to make the mind more 'brain-like'.

(b) Cognitivism (computationalism). In contrast, the cognitivist - 'cognitive' in a narrower sense - proposes that the mind is made up of computational systems, the function of which is described as 'information-processing'. Significantly, the information in question comes in the form of mental representations which are 'about' the world in some particular way; the processing occurs by transforming one mental representation into another through the application of some sort of algorithm.[7] For specific arguments, the term 'cognitive' will be used to refer to cognitive processes of this functional nature, whilst the term 'computational' will be used to *describe* both these and perceptual processes. Psychologists attempt to investigate the mind's computational systems by conducting empirical experiments, whereas philosophers do so through thought experiments and logical argument. In both cases, functional explanations move away from neurobiological ones, those concerned effectively attempting to make the mind even more 'mind-like'.

(c) Intentionalism. The third and final level of explanation is somewhat miscellaneous. Whereas associations and computations are capable of operating in a subpersonal and non-conscious fashion, the intentionalist attempts to understand the spectator's mind in terms of personal and conscious mental states - notably, their thoughts and feelings 'about' the world which surrounds them. Here, the main method of investigation is introspection and verbal report; that is, the investigator can actually ask the spectator questions along the lines of, "What did you think?" and "What did you feel?" Intentionalist explanations are functional to the extent that thoughts (as cognitive states) perform a causal role in the mental life of the spectator, and non-functional to the extent that feelings (as qualitative or phenomenological states) do not.

Table 1.9: A cognitive approach

	levels of explanation
(1) neuro- (brain, 'hardware')	(a) neurobiology
	(b) associationism (connectionism)
(2) functional (mind, 'software')	(c) cognitivism (computationalism)
	(d) intentionalism (?)

[7] Cognitivism / computationalism is related to Continental Rationalism to the extent that mental representations are said to be 'innate' or 'nativist'.

(ii) An evolutionary-ecological approach

The second approach can be regarded as a 'way of thinking' about the first approach as a whole and each of the levels of explanation with which it is associated.[8] The *theory of evolution by natural selection* was originally proposed by the British naturalist Charles Darwin in his 1859 book *On the Origin of Species.* Since then, it has been developed and popularised by the biologists George Williams (1966) and Richard Dawkins (1976) among others. Evolutionary theory begins with an ecological premise. Every organism has an environment with which it interacts. At any given time, that environment presents a number of 'adaptive problems' which must be solved in order to ensure survival and reproduction; obvious examples include obtaining food, finding mates, and avoiding predators. The evolutionary process itself operates by the mechanisms of 'blind variation' and 'selective retention' (BVSR).[9] Occasionally, errors in the genetic copying process result in new 'adaptations' (or slight improvements to existing ones), where an adaptation is defined as a mechanism which is capable of solving a problem of the nature described (BV). Those organisms which are thus advantaged stand a better chance (almost by definition) of surviving, reproducing, and passing their advantageous genes onto the next generation, the members of which also stand a better chance of surviving, reproducing, and so on (SR). Gradually, over a large number of generations, complex adaptations emerge.

In the case of the spectator's brain, evolutionary theory can be applied to the neurobiological approach to form *evolutionary neurobiology.* Returning to MacLean's triune brain theory, the subcortical regions of the brain can be roughly divided into reptilian adaptations to environments from the Mesozaic Era (248 to 65 million years ago) and mammalian adaptations to environments from the so-called Tertiary Period of the subsequent Cenozoic Era (65 to 1.8 mya.). The neocortical regions of the brain, on the other hand, can be roughly regarded as human adaptations to environments from the same era's Quaternary Period (beginning 1.8 mya). At this advanced stage, considerations of the brain inevitably turn into considerations of the (human) mind, necessitating a shift in approach. In the case of the mind, evolutionary theory can be applied to the functional approach, and computationalism especially, to form *evolutionary psychology* (see Cosmides, Tooby, and Barkow, 1992). Evolutionary psychologists describe the set of selection pressures which shaped the mind as the 'environment of evolutionary

[8] Hogan (2003) refers to evolutionary theory as a 'meta-level' of explanation.

adaptiveness' (EEA). Regarding the Quaternary Period, the EEA is equated with the Pleistocene Epoch - 1.8 million to 10,000 years ago - in particular. (The Holocene Epoch - 10,000 years ago to the present day - is regarded as being too short a period of time for complex psychological adaptations to have evolved.)

In terms of a research strategy, the evolutionary-ecological story can be told in reverse order, functional considerations preceding neurobiological ones (see Figure 1.1). Several theorists have argued that understanding an adaptive problem is crucial to understanding the computational mechanism which is 'designed' to solve that problem, whilst understanding a computational mechanism is crucial to understanding that mechanism's hardware implementation (see Cosmides et al., ibid.; Marr, 1982). This strategy will be explicitly employed in the early stages of the thesis.

Figure 1.1: Three levels of explanation

evolutionary-ecological level:
adaptive problem

↓ ↑

functional level:
computational mechanism

↓ ↑

neurobiological level:
hardware implementation

When it comes to the domains of art and fiction, evolutionary theory yields the following question: why does the modern day spectator have the capacity to respond emotionally to fictional (i.e., non-existent) characters and events? Is this capacity: (1) an adaptation; (2) the byproduct of an adaptation; or (3) simply genetic noise? Given that the capacity is too elaborate and robust for genetic noise, the answer seems to lie in either the adaptationist or byproduct hypotheses.

(1) The adaptationist hypothesis. In order to understand the adaptationist hypothesis, let us focus on two fundamental dimensions of the EEA. *(a) Reality.* The Pleistocene saw the birth of the first type of human society: namely, the 'hunter-gatherers' (see Lenski, 1970). It is thought that our ancestors lived on the African savannah in tribes of between fifty to eighty people. Wandering from plain to plain, they obtained their food

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[9] Terms originally coined by Donald T. Campbell (1960).

by hunting animals and gathering plants, the two labours being divided between men and women respectively. Technology was basic, extending to the making of tools, clothes, and shelter. The main social institution was the nuclear family (parents and children), marriages usually taking place between tribes. Other social institutions - politics, law, education, and science - were minimal. (In contrast, the Holocene has seen the birth of horticultural, agrarian, industrial, and post-industrial societies.)

(b) Representation. In addition to the physical entities of objects and events, the Pleistocene would have contained two basic categories of representation (see Sperber, 2000). Examples of 'mental representations' would have included the beliefs and desires of individual people, whilst examples of 'public representations' would have included language and pictures. Significantly, these two basic categories would have given rise to four categories of 'metarepresentation': for instance, mental representations of mental representations (say, the thought, "The man believes that X.") would have formed the basis of the capacity to read other people's minds, whilst public representations of mental representations (say, the utterance, "The woman desires that Y.") would have played an important role in both conversation and story-telling.

(2) The byproduct hypothesis. In order to understand the byproduct hypothesis, we must highlight two fundamental properties of the evolutionary process. According to the property of *non-teleology*, the process is entirely devoid of goals and intentions. Although it effectively designed the psychological adaptations for manipulating representations in general, it could not have anticipated the recent, (post-)industrial invention of cinematic representations - qua disembodied 'patterns of light and sound' - in particular. Meanwhile, the property of *conservation* (or *co-optation*) means that the process does not discard older adaptations when new challenges and innovations come along. Instead, it conserves and co-opts those adaptations by building both on top of them and with them. The net-result of these two properties is that the modern day spectator must process cinematic representations using adaptations designed in a different time and for a different purpose.

(c) Overview of thesis

My main strategy for solving the paradox of fiction - and the related paradoxes of representation and empathy - will be to revise the third proposition by removing existence beliefs (presence beliefs, relevance beliefs) from the psychological equation: as we have seen, this strategy can be divided into direct and indirect approaches. In turn, the process of 'direct engagement' can be divided roughly into a *seeing stage* and a *reacting stage*: it seems reasonable to say that we must 'see' an object or event in some way, before we can 'react' to that object or event. An additional strategy will be to revise the Cartesian framework which underlies the paradox as a whole. Both of these tasks will be achieved by referring to *modular* and *multi-level theories* of the mind/brain and the emotion system.

Each of the four main chapters of the thesis will make a number of fundamental distinctions, and adopt two or more of the four principal levels of explanation, whilst arguing from a broadly evolutionary perspective (see Table 1.10). In contrast to Grand Theory, the project should be thought of as providing a framework for integrating various piecemeal or middle-level theories.

(i) Chapter 2

Psychological beginnings:
Ways of seeing the world and the cinema

My aim in Chapter 2 is to offer a *preliminary solution* to the paradox of fiction by outlining a modular and computational view of the mind/brain - a view which comes under the rubric of 'psychological beginnings'. In particular, the chapter will address the first half of our 'direct' relationship to the world and the cinema by considering the 'seeing stage' of the reception process: in total, four different ways of 'seeing' the world and the cinema will be described. These four ways will be related to Wittgenstein's notions of 'regarding-as' and 'seeing-as', and Gibson's notions of 'direct perception' and 'affordances'. Throughout, the discussion will appeal to both functional and neurobiological levels of explanation, whilst adopting a broadly evolutionary perspective.

The first part of the chapter will consider the role of *Fodorian modularity*. The philosopher Jerry Fodor's (1983) proposal that our perceptual systems are modular in nature will provide us with a possible solution to the paradox of representation. Considering that our visual and auditory systems are 'encapsulated' from, and 'impenetrable' to, our all-important existence beliefs, it is plausible that they produce 'shallow outputs' which inform the rest of the mind that we are in the 'presence' of actual people and events. In addition, this line of reasoning will be combined with the 'threshold model of social influence' from the field of virtual reality to produce an explanation for our feeling of being 'immersed' in the filmic world (the so-called 'diegetic effect'). The second part will consider the role of *Darwinian modularity*. Evolutionary psychologists propose that central capacities are also modular in nature: significantly, although these capacities are not encapsulated in a Fodorian sense, they may be equally blind to our existence beliefs. In particular, the discussion will focus on how the 'mind-reading system' may mistakenly treat film characters as (actual) intentional agents and how 'emotional autoappraisers' may mistakenly treat filmic events as being of (actual) significance to our own goals and concerns.

The third part of the chapter will consider the role of *central processing*. Fodor's (1983) proposal that the central systems of the mind are non-modular will provide us with a possible insight into why, contrary to the implications of both the paradoxes of representation and fiction, we are not the unwitting subjects of certain types of epistemic illusion. Considering, for instance, that our central systems are 'sensitive' to non-existence beliefs and so forth, it is plausible that they produce 'deep outputs' which succeed in distinguishing a cinematic representation from the actual referent on the one hand, and a fiction film from a non-fiction film on the other. The fourth and final part will consider the role of *conscious (attentive) processing*. The related phenomena of consciousness and attention 'emerge' from a hierarchy of processors operating in parallel. In particular, the discussion will focus on how we consciously attend to the perceptual and narrational information presented by a film, and how we may deliberately employ various detachment and engagement strategies.

(ii) Chapter 3

Outlining a multi-level model of the emotion system:
Ways of reacting to the world and the cinema

My aim in Chapter 3 is to offer a *primary solution* to the paradox of fiction by outlining a multi-level model of the emotion system at a coarse-grain level of analysis. In particular, the chapter will address the second half of our 'direct' relationship to the world and the cinema by considering the 'reacting stage' of the reception process: some of the basic ways of 'reacting' to the world and the cinema will be described in turn. This time, the discussion will use the neurobiological level of explanation as a guide to the functional level, whilst continuing to adopt a broadly evolutionary perspective.

The first part of the chapter will focus on our *emotional relationship to the world.* Centring on the emotions of fear and disgust, it will consider the impact of emotional stimuli by asking the question of what happens when, say, we encountering a threatening creature such as a snake. In general, the discussion will provide an overview of the input, induction, and response stages of the emotional process. More particularly, the neurobiological accounts of the neuroscientists Joseph LeDoux and Antonio Damasio will allow us to gain an understanding of the basic relationship between our perceptual, cognitive, and emotional systems on the one hand, and the role of the body on the other. The functional account of Fodor, on the other hand, will allow us to clarify the precise nature of the information which is processed by, and passes between, each of these systems.

The second part of the chapter will focus on our *emotional relationship to the cinema.* Staying with the emotions of fear and disgust, it will consider the impact of films from both the horror and war genres by asking the question of what happens when a film presents us with, say, an image of a snake. With respect to the input and induction stages of the emotional process, a combination of the neurobiological and functional accounts will yield the following hypothesis. On the one hand, it is plausible that our perceptual (cortical) systems - in virtue of being 'informationally encapsulated' - produce the basic categorization, "A snake of such-and-such a description" as a shallow input. On the other hand, our central (prefrontal) systems - in virtue of being 'sensitive' to non-existence beliefs - produce the abstract categorization, "<u>Cinematic representation of</u> a snake of such-and-such a description" as a deep input. Considering that our emotion system (amygdala) is blind to the true nature of stimuli and receives both types of input simultaneously, we have a possible case of the blind being led by the foolish as well as the (apparently) wise. An examination of the response stage will be used to address the question of whether cinematic emotions should be classified as 'real' or 'quasi', and to tackle a fourth paradox not mentioned so far. It is plausible that the *paradox of horror* - which is concerned with the conundrum of why viewers choose to subject themselves to aversive experiences - can be partly solved by acknowledging that our fear and disgust responses to horror films may play an important role in 'organising' the internal structure of our fear and disgust systems.

(iii) Chapter 4

Developing a multi-level model of the emotion system:
Tracing the associative network and cognitive appraisal routes to (cinematic) emotion

Considering the limitations of the neurobiological approach, my aim in Chapter 4 is to develop a multi-level model of the emotion system at a fine-grain level of analysis, thereby offering what could be described as a *secondary solution* to the paradox of fiction. The SPAARS approach advanced by the psychologists Mick Power and Tim Dalgleish (1997) will provide us with a framework for our investigation. In total, two different routes to (cinematic) emotion will be traced. This time, the discussion will appeal to both connectionist and cognitive levels of explanation.

The first part of the chapter will trace an *associative network route to (cinematic) emotion*, thereby enabling us to account for the impact of the (multiple) emotion cues presented by film. In order to allow for continuity, the discussion will stay with the emotion of fear and the horror genre. Following a consideration of associative and connectionist networks, we will be in a position to understand the impact of three types of emotion cue: namely, diegetic cues presented from within the world of the fiction film (the most obvious sources being the character and their situation), non-diegetic cues presented from outside the world of the film (the most obvious example being music), and somato-visceral cues originating in the 'theatre' of the viewer's brain and body. (The discussion will conclude by suggesting that all of these emotion cues act as affective prompts for emotional imagery.)

The second part of the chapter will trace a *cognitive appraisal route to (cinematic) emotion*, thereby enabling us to account for the meaning of the situations encountered by (goal-oriented) characters. Following a consideration of appraisal theory, three types of appraisal will be distinguished. The notion of 'primary appraisal' will be related to the second way of seeing cited above: it will refer to the automatic, indiscriminate process which appraises the situations presented by film as if they were real and of personal significance, thereby producing 'appropriate' emotional responses. (In this instance, the absence of existence beliefs is compensated by the presence of the diegetic effect.) The notion of 'secondary appraisal', on the other hand, will be related to the third way of 'seeing': it will refer to the 'globally sensitive' process which appraises the representational and fictional status of the situations in question, thereby minimising the potential 'intensity range' of our emotional responses. Finally, the notion of 'reappraisal' will be related to the fourth and final way of 'seeing': it will refer to the reflective process which appraises the depicted situation from the perspective of the characters, thereby maximising our emotional responses within the reduced intensity range. (In this instance, the absence of existence beliefs is compensated by the presence of motivational prompts.)

(iv) Chapter 5

Re-tracing the simulative route to (cinematic) emotion:
Emotional constraints and emotional alternatives

Having outlined and developed a multi-level model of the emotion system, my aim in chapter 5 is to address our 'indirect' relationship to the world and the cinema, thereby offering what could be described as a *tertiary* solution to the paradox of fiction. In particular, the chapter will attempt to (re-)trace the simulative route to (cinematic) emotion: given that appeals to 'thought' and 'imagination' are potentially problematic, we should ascertain to what extent the multi-level model in question acts as both a 'constraint' on, and an 'alternative' to, emotional simulation. (In addition, the whole discussion will be related to the emotional phenomenon of empathy, thereby bringing the paradox of empathy into the equation. All four levels of explanation will be appealed to.)

The first part of the chapter will investigate the extent to which *association acts as a 'constraint' on simulation*. In order to do this, the discussion will reconsider some of the fear examples from previous chapters. A reconsideration of associative networks from both a neurobiological and a connectionist perspective will yield the following two points. First, it is plausible that both 'direct' perception and 'indirect' simulation utilise the same nodes in the mind/brain, the external perceptual information presented by fiction films making the internal activity of perceptual imagining largely superfluous. Second, the direct activation of nodes may serve as an affective prompt for emotional imagery, whilst our capacity to respond emotionally to this imagery may be dependent on a 'critical number' of associated nodes being (directly) activated.

The second part of the chapter will investigate the extent to which *appraisal acts as an 'alternative' to simulation (and theory)*. In order to do this, the discussion will turn from the emotion of fear to the related emotions of anxiety and concern, and focus on filmic examples of surprise and suspense. If emotional simulation operates in an unintentional, non-conscious fashion, begins with either the world or the film, and successfully bridges the gap between theory and experience, then it can be spelt out in the more literal terms of automatic appraisal. Likewise, if emotional simulation proceeds in a conscious, intentional fashion, then it can be spelt out in terms of reflective appraisal. (The emotional responses generated by automatic appraisal may serve as motivational prompts for its reflective counterpart.) The chapter will conclude by proposing that the term 'simulation' should be reserved for those instances in which we deliberately attempt to imaginatively entertain the thoughts and feelings of a character.

Table 1.10: Overview of thesis

	fundamental distinctions	**principal levels of explanation**
Chapter 2	(1) Fodorian modularity	functional ▶ neurobiological
	(2) Darwinian modularity	ibid.
	(3) central processing	ibid.
	(4) conscious (attentive) processing	ibid. (plus intentional)
Chapter 3	(1) real world emotions	neurobiological ▶ functional
	(2) cinematic emotions	ibid.
Chapter 4	(1) associative network route to (cinematic) emotion	connectionist (plus intentional)
	(2) cognitive appraisal route	cognitive (plus intentional)
Chapter 5	(1) simulative route to (cinematic) emotion, constraints on	all
	(2) simulative route, alternatives to	all

N.B. The evolutionary-ecological approach can be regarded as a complementary perspective.

CHAPTER 2

Psychological Beginnings: Ways of Seeing the World and the Cinema

CHAPTER 2

Psychological Beginnings: Ways Of Seeing the World and the Cinema

2.1 INTRODUCTION [1]

(a) Revising the third proposition

How should we understand our capacity to engage with the world and the cinema? How should we understand our psychological relationship to actual objects and events, and to cinematic representations of those objects and events? The paradox of fiction provides us with a potential framework for answering such questions. As we have seen, the paradox consists of three propositions which, though seemingly sound when considered individually, produce a contradiction when considered collectively; the main strategy for solving the paradox is to revise the third proposition which states that we must believe in the existence of a given scenario in order to engage with that scenario.

In light of this, the first objective of our investigation is to eliminate so-called 'existence beliefs' from the psychological equation. The most obvious way of undertaking this task is to consider *direct theories* of psychological engagement: that is, theories which propose that we engage with the world - and the cinema - in the absence of (conscious) mental activity. In turn, the process of 'direct engagement' can be divided roughly into a *seeing stage* and a *reacting stage*: it seems reasonable to say that we must 'see' an object or event in some way, before we can 'react' to that object or event. In this chapter, then, we will consider the first half of our 'direct relationship' to the world and the cinema by focusing on the seeing stage of the reception process.

[1] The term 'seeing' in the chapter title is inspired by Wittgenstein's (1958) discussion of the verb 'to see'.

(i) A Wittgensteinian / Gibsonian approach to 'seeing'

How should we understand the notion of 'seeing'? The first example of a direct approach is provided by Ludwig Wittgenstein's (1958) discussion of the verb 'to see' in the *Philosophical Investigations.* In this discussion, Wittgenstein is concerned with the concept of 'seeing', rather than the causes underlying seeing. According to his notion of *regarding-as*, we are capable of perceiving the world in a 'direct' fashion; that is, in the absence of mental interpretation - where mental interpretation is presumed to be a conscious activity. This conceptual approach forms the basis of Malcolm Turvey's (1997) *seeing theory* of emotional responses to fiction. Turvey applies the notion of 'regarding-as' to the case of cinematic perception, and, by equation, to the case of cinematic emotion: viz. if we are capable of perceiving the objects and events depicted by cinema in a direct fashion, then we are also capable of reacting to them in the same way. (Wittgenstein also introduces the notion of *seeing-as*: a type of perception which *does* involve an element of mental interpretation. As we will see, this notion also plays an important role in understanding our discriminatory and attentive relationship to cinematic representations.)

The second example of a direct approach is provided by J. J. Gibson's (1979) ecological approach to visual perception. In the standard laboratory experiment on visual perception, the observer is presented with discrete 'snapshots', whilst being kept stationary (cf. the cases of painting and photography). Gibson recognised, however, that a real world observer samples the light reflected from the surfaces of (mobile) objects in their environment, whilst moving through that environment: the function of visual perception is the detection of 'invariants' specified by the 'ambient optic array'. The ecological approach forms the basis of Joseph Anderson's (1996) contribution to cognitive film theory. Although Anderson is not primarily concerned with the paradox of fiction - and the index to his book only contains two references to the subject of emotion - he singles out two aspects of Gibson's ecological approach which are a 'priceless gift for film theory'. The first is the theory of *direct perception*: the perception of the objects and events in our environment is direct; that is, it is not mediated by either mental representations or inferential processes. The second is the theory of *affordances*: not only are we capable of directly perceiving what an object or event is; we are also capable of directly perceiving what that object or events 'offers' us (either for good or ill).

(ii) A computational approach

Having eliminated (conscious) mental interpretation from the equation, how should we deal with causal processes which fall outside the mental realm? Wittgenstein does not make reference to the causes of visual perception because his project is a conceptual one; he pointedly remarks that the causes 'are of interest to psychologists' (p.193). Gibson, on the other hand, refused to make reference to inferential processes and mental representations because he assumed that such a move would lead to the notion of a little man - or 'homunculus' - residing in the mind, which, in turn, would lead to an infinite regress.

As a follower of Wittgenstein's later philosophy, Turvey chooses to dismiss causal processes; indeed, in a later article with Richard Allen (2001), he argues that making reference to processes of which we are not aware is fundamentally mistaken. (This argument will be addressed in Chapter 6, as part of my conclusion.) In contrast, I will follow Anderson's example by making reference to what has been described as the *computational theory of mind*. Although the computational theory can be traced back to Alan Turing (1950) - one of the inventors of the computer - we should not take the theory as proposing that the computer and the mind operate in exactly the same way. Rather, computations can be defined in relatively neutral terms as formal operations on (syntactically structured) mental representations.

(b) Revising the underlying framework

Is attempting to revise the third proposition of the paradox of fiction the only way forward? One could argue that the incentive to remove one type of mental state (namely, existence beliefs) from the psychological equation stems from the assumption that contradictory mental states are problematic. The second objective of this chapter, then, will be to challenge the framework which underlies the paradox as a whole.

(i) A Cartesian view of the mind/brain

How should we understand the framework in question? Gregory Currie (1995, p.83) describes the *Cartesian view* of the mind/brain as follows: 'the mind is a unified and indivisible organ, transparent to itself, and identical with the person whose mind it is.' If we adhere to this view, our emotional responses to fiction are indeed problematic: we seem to be faced with the case of a single ego engaging in what George Orwell would describe as 'doublethink' by holding contradictory beliefs simultaneously.

Although the Cartesian view of the mind/brain is officially attributed to the seventeenth century rationalist philosopher René Descartes, what could be described as the 'Cartesian instinct' has its roots in at least two aspects of our everyday lives. The first aspect is our use of language. The mind/brain seems to be a unified and invisible organ partly because it speaks in the first-person singular - 'I', 'me', 'mine', and so forth - through our mouths.[2] The second aspect is our reliance on phenomenology. The mind seems to be a unified and indivisible organ partly because we are conscious of a unified and indivisible experience, and unconscious of the causal mechanisms and processes which bring this experience about.[3]

(ii) A modular view

How should we go about challenging the Cartesian view of the mind/brain? From both a functional and a neurobiological perspective, the mind/brain is believed to be *modular* in nature. The basic idea is that the mind/brain is composed of a number of computational systems or levels, each system or level responsible for a different type of information processing; crucially, different types of information either pass or fail to pass from one system or level to another.

[2] Phrasing inspired by Nagel (1989, p.89): '[The mind/brain] speaks in the first person singular through our mouths, and that makes it understandable that we should think of its unity as in some sense numerically absolute, rather than relative and a function of the integration of its contents.'

[3] Phrasing inspired by Spinoza (1955): 'Men believe themselves to be free, simply because they are conscious of their actions, and unconscious of the causes whereby those actions are determined.' Cited by LeDoux (1998), p.267.

The notion of 'modularity' was resurrected by the philosopher Jerry Fodor (1983) in an essay entitled *The Modularity of Mind.* In short, Fodor proposes that the mind/brain is composed of three types of system. To begin with, *transducers* at the body's 'surfaces' - for example, the retina of the eye or the cochlea of the ear - convert physical stimulus energy into electrical (neural) signals. Subsequently, these signals are sent to (modular) *input systems* - for example, one of the five perceptual systems or a preliminary language-processing system - for a procedure described as 'input analysis'. In turn, the results of input analysis are sent to (non-modular) *central systems* for what could be described as cognitive processing.

Other theorists have described similar views of the mind/brain. The evolutionary psychologists Leda Cosmides and John Tooby (1992) describe the mind/brain as a coalition of specialists; in contrast to Fodor, they propose that many cognitive (i.e., central) capacities are also modular in nature. The philosopher Daniel Dennett (1978, 1991) describes the mind/brain as a hierarchy of homunculi operating in parallel; in particular, he proposes that consciousness is equivalent to a 'serial virtual machine' which emerges from this hierarchy. The neuroscientist Michael Gazzaniga (1978, 1992) proposes that the two hemispheres of the brain are responsible for different aspects of the mind, the left hemisphere acting as an 'interpreter' for the activities of the right; in particular, he argues that '98 percent' of the brain's activities operate below consciousness, the upshot being that we are only aware of the end-results.

If the mind/brain is not a single agent but what Marvin Minsky (1986) describes as a 'society' of mental agents, then the problem of contradictory mental states co-existing, begins to disappear. Here, it should be acknowledged that the logic in operation is extremely basic - from a logician's point of view, perhaps embarrassingly so. The real battle, however, lies with accepting a more mechanical view of the mind/brain which, in addition to being counter-intuitive, threatens to undermine our cherished notions of personal identity and free will.[4]

* * *

[4] Eddy Zemach (1996) has proposed a similar solution to the paradox of fiction. Zemach refers to the modularity of the mind, and the existence of multiple belief 'processors' or 'dossiers'.

In brief, my aim in this chapter is to offer a *preliminary solution* to the paradox of fiction by outlining a modular and computational view of the mind/brain - a view which comes under the rubric of 'psychological beginnings'. In total, I will discuss four different ways of seeing the world and the cinema: namely, (1) *Fodorian modularity*; (2) *Darwinian modularity*; (3) *central processing*; and (4) *conscious (attentive) processing*. Where appropriate, I will relate these four ways to Wittgenstein's notions of 'regarding-as' and 'seeing-as', and Gibson's notions of 'direct perception' and 'affordances'. Although the chapter will cover some old ground along the way, I feel that there is a need to place the theories proposed by various philosophers and cognitive film theorists into a larger framework - and to make a distinction between different levels of explanation - whilst acknowledging the scope and limits of such an enterprise. In addition, many of the theories in question have been only concerned with perception and cognition thus far; I wish to specify potential relations to the emotion system whenever possible.

2.2 MODULAR PERCEPTUAL SYSTEMS: PRODUCERS OF 'SHALLOW OUTPUTS'

(a) Perceiving the world: Fodorian modularity [5]

> "If called by a panther / Don't anther."
> From 'The Panther' by Odgen Nash (quoted by Fodor, 1983, p.70)

> "He who attempts to tease a cobra / Is soon a sadder he, and sobra."
> From 'The Cobra' by Odgen Nash

How should we understand our perceptual relationship to the world? This question brings us to a consideration of Fodor's (1983) arguments in *The Modularity of Mind* for the 'modularity' of our perceptual systems. Whereas Fodor focuses on constructing a modular (and computational) account for the case of 'psycholinguistics' or 'language-processing', we will focus on constructing an equivalent account for the sense of *vision*. Considering that we are ultimately concerned with the bi-modal medium of cinema, we will also make

[5] With respect to film theory, Fodorian modularity is briefly discussed by Currie (1995, p.85). Currie effectively combines Fodor's modular view of the mind with Dennett's homuncular view (to be discussed in section 2.5). As evidence for the modular / homuncular view, Currie cites 'object' and 'face-blindness' (cf. Fodorian modularity) and the findings of split-brain studies (cf. the experiments by Gazzaniga - to be discussed in section 3.2).

some brief remarks about the sense of *audition*. (Fodor's own views will be directly acknowledged in the text.)

In order to understand the fundamentals of both senses, it will be helpful to envisage the simpler environment of our hunter-gather ancestors in the Pleistocene, and our non-human ancestors in the many ages before that; an environment containing potential food and mates for the organism's good, and more saliently perhaps, potential predators - in the form of wild cats and snakes - for the organism's ill.

(i) The visual system

Vision has been described as 'the distance sense *par excellence*': no other sense provides us with such an instant overview of our immediate environment. Starting from an ecological (and thereby evolutionary) perspective, the domain of the visual system is solving the adaptive problem of *visual scene analysis*, whilst the default mode of the visual system is effectively naïve realism (that is, the world is how it appears). In order to achieve solve this problem, the visual system must effectively answer two key questions: first, *What are the objects and events in the immediate environment?*; and second, *Where are those objects and events?* Both of these questions can be broken down into a series of sub-questions; in this respect, one can think of the visual system as a 'collection' of modules, each module specialising in the analysis of a certain type of visual input. With respect to the 'what' question, possible examples of modules include edge detectors, shape detectors, and mechanisms for colour perception; in addition, there may be mechanisms for such 'higher-level' functions as object perception and face perception. With respect to the 'where' question, on the other hand, possible examples of modules include motion detectors and mechanisms for spatial perception. The modularity of the visual system can be addressed from two basic perspectives (see Table 2.1).

(1) A functional perspective. For Fodor, the essence of modularity lies in the property of *informational encapsulation*. Although the modules within the visual system can communicate with each other, the visual system as a whole only has access to the outputs of transducers, a 'proprietary database', and a 'form-concept dictionary'; it is encapsulated with respect to information from outside its particular domain. The precise nature of this encapsulation can be clarified by making reference to Zenon Pylyshyn's (1980) notion of *cognitive impenetrability*. According to this notion, the visual system

cannot be 'penetrated' by the epistemic mental states which are the domain of the central systems of the mind: for instance, our beliefs, desires, and expectations regarding the true nature of our environment. In particular, it cannot be penetrated by what we have described as our *existence beliefs*: namely, our beliefs in the existence of either the panther or the snake. Closely related to the properties of 'informational encapsulation' and 'cognitive impenetrability' are the properties of *mandatory* and *fast operation*; visual perception is like a reflex, albeit more complex. An explanation for all of these related properties can be couched in ecological terms: if visual perception is to be adaptive in a competitive environment, then it must be both accurate and instantaneous; and if it is to be accurate and instantaneous, then it cannot afford either to search through the entire contents of our minds or to be influenced by our potentially fickle and unreliable beliefs, desires, and expectations.

Given the informational encapsulation and so forth of the visual system, how does it go about the process of scene analysis? This question can be answered by way of a re-consideration of Gibson's (1979) theory of *direct perception*. Gibson's theory entails two levels of explanation. At the ecological level, 'invariances' in the ambient optic array would 'specify' the presence of either the panther or the snake. At the physiological level, on the other hand, the nervous system would be structured in such a way as to 'resonate' to the invariances in question. Following David Marr's (1982) *computational theory*, a computational level of explanation is required to redefine the 'specification-resonation' relationship by explaining how invariances are actively processed - rather than passively picked up - by the nervous system (see Bruce, Green, and Georgeson, 1996, Ch. 17). From our perspective, the important point about computational theory is that it replaces the inferential processes and mental representations - rejected by Gibson for the reasons cited above - with computational operations performed on a series of 'sketches'.[6] In order to facilitate such computations, the proprietary database of the visual system contains various 'assumptions' about the nature of the world.[7] As physical and mobile objects, both the panther and the snake would have a number of basic properties: they would be solid,

[6] Anderson (1996, pp.30-31) also argues that Gibson's ecological approach should be combined with Marr's computational approach.

[7] These assumptions are described by Anderson (1996), p.33-35; and Pinker (1997), pp.28-29.

bounded, and evenly lit; they would tend to move in a single direction; and whilst moving, they would continually cover and uncover parts of the background.[8]

The final stage of visual scene analysis is of particular significance. According to Fodor, the visual system produces *shallow outputs*. In order to understand what is meant by the term 'shallow', we should envisage a kind of halfway point between two extremes. On the one hand, the outputs of the visual system are not as 'shallow' as what Marr would describe as an incomplete 'primal' or '2.5-D sketch' of, say, the panther or the snake. On the other hand, they are not as 'deep' as the scientific classification that the panther or the snake is, say, a member of a rare and endangered species. Instead, the outputs of the visual system should be thought of simply in terms of the *basic categorizations* "panther" and "snake": these categorizations are 'reliably predicted' by the visual properties of the respective stimuli and 'phenomenologically given'. Following Marr and Nishihara (1978), Fodor suggests that 'the final stage of visual input analysis involves accessing a 'form-concept' dictionary which, in effect, pairs 3-D sketches with basic categories.' (Presumably, the visual system also produces what could be described as *basic localizations*.)[9]

In short, what we want to say is that the visual system produces representations of recognizable (and localizable) objects and events - no more and no less - and that these representations are passed onto the other systems of the mind in an informational sense, whilst being made available to us as conscious percepts in a phenomenological sense. It should be stressed that although shallow outputs have both perceptual and phenomenological content, they are *not* equivalent to perceptual beliefs. As we will see, the fixation of perceptual belief is the domain of central processing. In a related fashion, we need not describe shallow outputs as having existential import: for instance, they do not assert that, "The panther exists" or, "This is an actual snake". Given that the default mode of the visual system is naïve realism, the assumption of existence is implicit in the very process of scene analysis.

(2) A neurobiological perspective. Although Fodor is mainly concerned with functional properties, he implies that the visual system is 'associated' with *fixed neural*

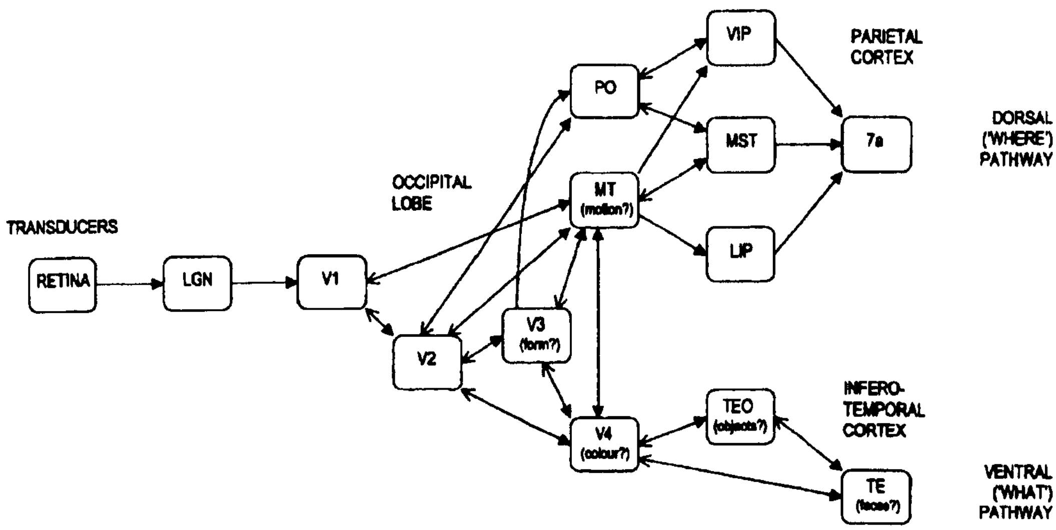
[8] In contrast, Bordwell (1985, pp.30-33) proposes a *constructivist theory of perception* inspired by Helmholtz: because sensory data is impoverished, percepts are 'constructed' by means of unconscious inferences; this theory stresses the role of ('top-down') knowledge, expectations, and hypotheses.

[9] Marr and Nishihara (1978) forms the basis of Marr (1982), Ch. 5. For more recent theories of object recognition, see Biederman's (1995) geon theory.

architecture. Significantly, this architecture exists at a *macroscopic scale* and can be detected psychophysically. Given that we are ultimately concerned with the connection between the visual system and the emotion system, it is necessary to give a rough sketch of the neuroanatomical structures involved (see Figure 2.1).

To begin with, photoreceptors in the *retina* of each eye send relatively processed information to the *visual thalamus* (or lateral geniculate nucleus) - a subcortical structure which has been described as a 'gateway' to the neocortex. More specifically, the thalamus 'relays' information to the occipital lobe and the striate region of the *visual cortex* (otherwise known as area V1) which is primarily concerned with the analysis of edges. After V1, the visual system divides into ventral ('what') and dorsal ('where') pathways - revealing that the 'what' and 'where questions' are dealt with separately. With respect to the 'what' pathway, area V3 of the extrastriate visual cortex is thought to be involved in the analysis of form and area V4 in the analysis of colour, whilst areas TEO and TE of the inferotemporal cortex possibly play a role in object and face perception respectively (see Zeki, 1993). Specific 'breakdown syndromes' of the latter two areas may result in 'object-blindness' (visual agnosia) and 'face-blindness' (prosopagnosia) respectively. With respect to the where 'pathway', on the other hand, area MT is thought to be involved in the analysis of motion. Each visual area contains at least one 'retinotopic map', and although processing does not happen in strict sequence - as the numbering of the areas suggests - one can think of representations as being built up in complexity as they 'ascend' the visual hierarchy.

Figure 2.1: The visual system



Adapted from Figure 4.10, Gazzaniga et al. (1998), p.133. Despite the necessary roughness of such a sketch - there are over thirty visual areas in total and each area is further subdivided both functionally and anatomically - it gives us some idea of how Fodorian modules may be realised in the brain.

(ii) The auditory system

Audition is another example of a 'distance sense'. The domain of the auditory system is solving the adaptive problem of *auditory scene analysis*. In order to achieve this, the auditory system must effectively answer the same key questions as the visual system: namely, *What and where are the objects and events in the immediate environment?* Although much less is known about how these questions are answered, it is plausible that a modular (and computational) account can be given. Starting from a functional perspective once again, it is reasonable to assume that the auditory system possesses the properties of informational encapsulation and cognitive impenetrability; that it operates in a mandatory and instantaneous fashion, by means of computational processes performed on a series of sketches, whilst having access to a 'proprietary database' which contains various 'assumptions' about the nature of the world; and that it produces shallow outputs in terms of 'basic categorizations' and 'basic localizations'.

Moving to a neurobiological perspective, the auditory system is also associated with fixed neural architecture (see Gazzaniga et al., 1998, pp.156-161). Auditory receptors in the *cochlea* of each ear send information to the *auditory thalamus* (or medial geniculate nucleus). In turn, the thalamus 'relays' information to the primary *auditory cortex* (area AI) and auditory association cortex (area AII), where the processing of auditory representations is dependent on a number of 'tonotopic maps'. In particular, the neurobiological account gives us clues as to how the auditory system would go about answering the 'what' and 'where' questions. With respect to the 'what pathway', our auditory system would use frequency variation to identify either the panther or the snake: the corresponding data would be sufficient to distinguish the sound of one from the other, even if the two sounds were 'operating' at the same pitch. The 'where pathway' can be sub-divided into a 'time pathway' and an 'intensity pathway'. Unlike photoreceptors in the eyes, auditory receptors in the ears do not encode spatial information. In order to localise the panther or snake in three-dimensional space, therefore, the auditory system would make reference to two cues: namely, the time difference between the corresponding sound reaching each ear and the intensity difference between the corresponding sound at each ear.

Table 2.1: Fodorian modularity (see Fodor, 1983)

	property	**description**
(1) functional	questions * (domain)	perceptual scene analysis: (i) what?; (ii) where?
	computational character / default mode	complete encapsulation / real objects and events
	answers (outputs)	shallow: (i) basic cat.; (ii) basic loc.
(2) neurobiological	neural architecture	fixed: macro-scale; detectable

* The evolutionary-ecological approach can be regarded as a complementary perspective.

(b) Perceiving the cinema: regarding-as (type I)

Having outlined our perceptual relationship to the world, how should we understand our perceptual relationship to the cinema? In order to answer this question, we must address two related conundrums.

(i) Solving the paradox of representation

The *paradox of representation* - and its problematic third proposition - is based on two related theories of perception (see Figure 2.2). The main theory is described by Allen (1997). According to the *causal theory of perception*, there is a 'causal relationship' between an object in the external world and our perception of that object. Here, the key question is: how can we perceive the object depicted by a representation when the object in question is not physically present? The additional theory is described by Turvey (1997). According to the *mental interpretation theory of perception*, perception involves the 'mental interpretation' of the 'material properties' of an object - presumably made known to us by means of 'impoverished' sensory data. Here, a key question might be: why do we mentally interpret the material properties of a represented object as if the object in question was physically present, when we know that this is not the case?

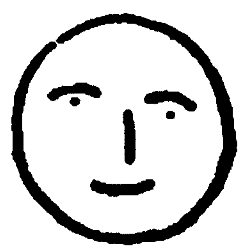
Figure 2.2: The causal and mental interpretation theories of perception

The key to revising the third proposition lies in adopting a direct approach. One of the main examples is provided by Turvey's seeing theory, based, in turn, on Wittgenstein's (1958) discussion of the verb 'to see'.[10] Wittgenstein refers to our 'standard visual experience' of objects as *regarding-as* or 'the "continuous seeing" of an aspect' (p.194, p.205). Take a look, for instance, at Wittgenstein's example of the 'picture-face' (see

[10] The following discussion will take Turvey's interpretation of Wittgenstein - as opposed to Wittgenstein himself - as its starting point.

Figure 2.3). In a strict sense, we do not perceive the 'material properties' of a circle surrounding four random lines and a couple of dots; rather, we continuously see the 'aspect' of a face. Significantly, Wittgenstein states: 'In some respects I stand towards [a picture-face] as I do towards a human face. I can study its expression, can react to it as to the expression of the human face.' (The picture-face will reappear in many guises throughout this thesis.)

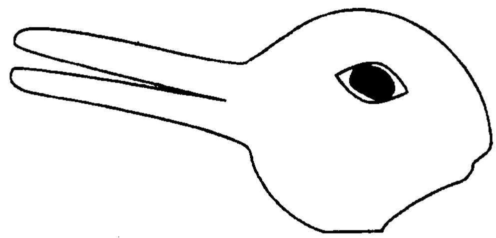
Figure 2.3: First example of regarding-as: Wittgenstein's 'picture-face'



Reproduced from Wittgenstein (1958), p.204.

In contrast, our 'exceptional visual experience' involves *seeing-as*, an example of which is 'the "dawning" of an aspect' (p.194, p.205). Take a look, for instance, at the Jastrow 'duck-rabbit' - an example of an ambiguous figure (see Figure 2.4). In this case, the aspect of either the duck or the rabbit may 'dawn' on us, thus taking us by surprise - a type of perceptual 'pop-out effect'. According to Turvey, however, the real value of the Jastrow duck-rabbit lies in the following. First, by presenting competing aspects, the figure makes us explicitly aware of the distinction between the 'aspect' of an object and its 'material properties'. Second, the phenomenon of aspect-dawning demonstrates that our perception of an aspect is *not* the result of (consciously-mediated) mental activity - evidence against the mental interpretation theory of vision. Contrary to first appearances, therefore, the duck-rabbit figure has greater implications for our understanding of standard, as opposed to exceptional, visual experience - regarding-as rather than seeing-as. (Wittgenstein cites our perception of the schematic triangle as a more straightforward instance of seeing-as - this example will be discussed in section 2.4.)

Figure 2.4: Second example of regarding-as: Jastrow 'duck-rabbit'



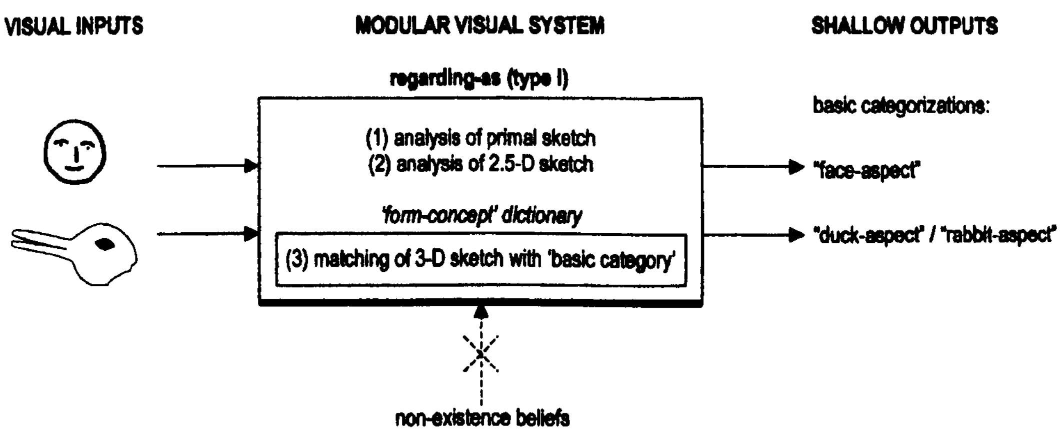
Reproduced from Pinker (1997), p.293. The Jastrow duck-rabbit has been discussed by a number of theorists, including Gombrich (1960), p.29.

At this point, we should introduce the notion of *regarding-as (type 1)* - the bracketed qualification will serve to distinguish it from another type of regarding-as to be discussed below. When Turvey identifies 'necessity and temporal instantaneity' as 'criteria' of Wittgenstein's notion of 'regarding-as' (ibid., p.447), he is effectively pointing to two properties of Fodorian modularity: namely, mandatory and fast operation respectively. In light of this, Wittgenstein's claim that our perception of the duck-rabbit figure does not require mental interpretation is another way of saying that our perception of the figure is mediated by a modular (and computational) visual system; a system which, crucially, is encapsulated from, and impenetrable to, non-existence beliefs (see Figure 2.5).

Presumably, the first and second stages of the process involve the analysis of primal and 2.5-D sketches respectively. A consideration of the third and final stage, on the other hand, leads us to the *recognition theory* of pictorial perception. Currie (1995, p.82) would claim that a picture of an animal and an actual animal trigger the same 'object recognition capacity'. In reply, Allen (1997, pp.88-91) argues that such an account personifies 'parts of the brain as homunculi'. Saying that a recognition capacity is being triggered, however, does not imply that any recognition is going on in the everyday sense of the word: the process in question can be spelt out in terms of the brute matching of a 3-D model with a 'basic category' stored in memory. (Object recognition is, to use Wittgenstein's phrase, 'forced from us' (p.197). All that is required of us is that we are 'already conversant with the shapes of those two animals'; that is, our memories must contain the relevant categories (p.207).)

Anderson (1996, pp.43-49) notes that the visual system 'cannot tolerate ambiguity'. In the case in question, then, the visual system will alternate between the 'duck-aspect' and the 'rabbit-aspect', producing either the basic categorization "duck" or the basic categorization "rabbit" as a shallow output and (conscious) visual percept. It should be noted, however, that Jastrow specifically designed the duck-rabbit figure in order to prevent the 'resolution of ambiguity'. Considering that the duck-rabbit figure does not have an obvious equivalent in the real world, one could argue that the term 'exceptional' should be reserved for the figure itself, as opposed to the modular (and computational) processes involved in perceiving it. Indeed, this observation reveals that the processes underlying our instantaneous perception of the picture of the duck-rabbit are more or less the same as those underlying our instantaneous perception of the picture-face - the main difference between the two being that the former involves two object recognition capacities, whereas the latter involves a single 'face recognition capacity'. In conclusion, Wittgenstein's example of the duck-rabbit enables us to explicitly experience Fodorian modules 'in action' as it were. Conversely, Fodor's modularity thesis enables us to understand the similarity between Wittgenstein's examples of the duck-rabbit and the picture-face.

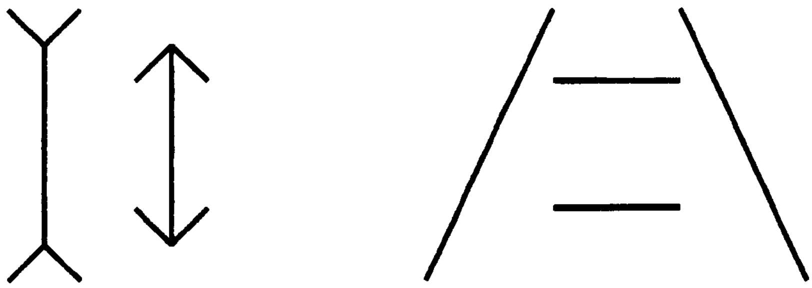
Figure 2.5: The mandatory nature of pictorial perception qua object recognition



The advantage of the duck-rabbit figure is that it demonstrates the mandatory nature of visual perception *qua* object recognition. We could also experience Fodorian modules 'in action' by considering any number of illusions (see Figure 2.6): for instance, the Müller-Lyer illusion (cited by Fodor, 1983, p.66) and the Ponzo illusion (discussed by Searle, 1992, pp.231-234).[11]

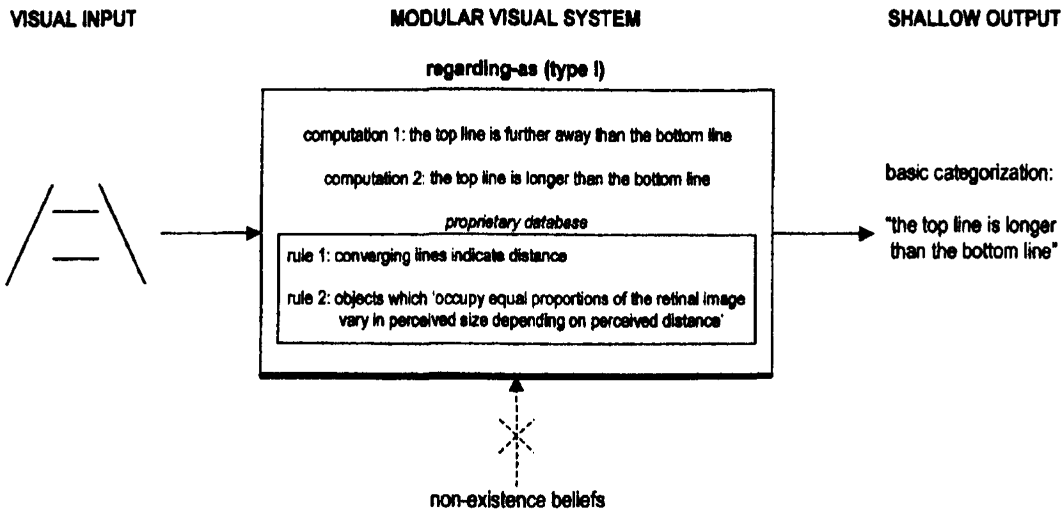
[11] For an example of modular language-processing, see Wittgenstein's (1958, p.198) discussion of our instantaneous perception of the word 'Pleasure'.

Figure 2.6: The Müller-Lyer illusion (left) and the Ponzo illusion (right)



A consideration of the Ponzo illusion brings us to the *illusion theory* of pictorial perception (see Figure 2.7). Allen argues that the illusion theory should be rejected because it assumes a causal theory of perception. In contrast, I would argue that the theory should be rejected for the following reasons. Consider the following thought experiment: If the visual system had been designed from scratch to cope with modern conditions - a world containing representations - then would it operate any differently? I would argue that the answer must be 'no'. Our visual system either makes specific 'assumptions' about the general nature of the world - for instance, 'converging lines indicate distance' - and inevitably makes the occasional error; or it make no 'assumptions' whatsoever and is completely incapable of solving the adaptive problem of scene analysis; a plausible compromise between these two positions is inconceivable. (This is not to say, however, that evolution always comes up with the best, or only, solution to a problem.) In the *Meditations*, Descartes claimed that the fact that we succumb to illusions is a reason to distrust our senses (and to doubt the existence of the external world, a precursor to the 'evil demon hypothesis'). On the contrary, we should regard such occurrences as indirect indications of an adaptive visual system. In conclusion, then, the notion of an 'illusion' should be discarded for its misleadingly negative connotations.

Figure 2.7: The mandatory nature of pictorial perception qua depth perception



(ii) Understanding the diegetic effect

So far, I have described the activity of being in front of, and detached from, a still picture. But the activity of film viewing may go several steps beyond this, culminating in a phenomenological experience which the film theorist Noël Burch (1979) describes as the *diegetic effect*. From our perspective, a film's diegetic effect can be understood in two senses: first, we may have the feeling of being in the *presence* of actual people and events; and, second, we may have the feeling of being *immersed* in the environment behind what Gibson (1979, p.301) describes as the 'magic window'. (According to this definition, presence and immersion can be thought of as opposite sides of the same coin.) Significantly, Ed Tan (1994; 1996, Ch. 3) claims that the diegetic effect influences our appraisal of a situation's emotional meaning; in other words, it has implications for solving the paradox of emotional responses to fiction. Tan implies, however, that the diegetic effect is based on some sort of illusion; in contrast, I will attempt to explain the effect in explicitly non-illusory terms by turning to a field of research commonly known as *virtual reality*.

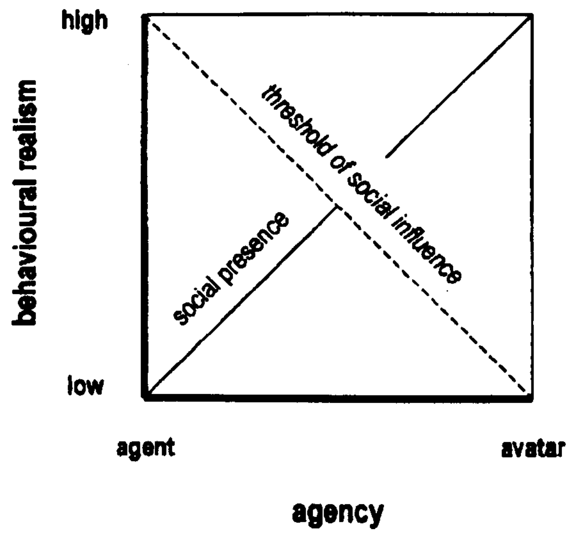
□ *Presence*

At the Research Center for Virtual Environments and Behavior (ReCVEB) at the University of California, Santa Barbara, Jim Blascovich and Jack Loomis have been using *immersive virtual environments* (IVEs) as a 'research tool' in perceptual, cognitive, and social psychology (see Loomis, Blascovich, and Beall, 1999).[12] An example of the type of research question which concerns them is as follows. Social psychologists assume that we must have the feeling of being in the 'presence' of an actual person, in order for that person to have an influence on our 'thought, feeling, and behaviour' (Allport, 1954). In light of this of this, imagine donning a 'head-mounted display' (HMD) and being confronted by a computer-generated landscape which stretches out to the horizon. In the distance, you catch sight of a human-like figure. This 'virtual other' is either a *computer agent* (akin to a character in a computer game) or a *human avatar* (controlled by an actual person outside the IVE).

In order to describe your relationship to this virtual other, Blascovich (2002a, 2002b) proposes the *threshold model of social influence* (see Figure 2.8). The vertical axis of the graph is concerned with the sensory realm: the factor of *behavioural realism* is the extent to which you perceive the virtual other as behaving in a realistic fashion - a continuum marked by the terms 'low' and 'high'. The horizontal axis, on the other hand, is concerned with the epistemic realm: the factor of *agency* is the extent to which you believe that the virtual other represents an actual person standing outside the IVE - a continuum with 'agent' at the low end and 'avatar' at the high end. Significantly, Blascovich describes a functional, or compensatory, relationship between these two factors - a relationship which is indicated by the diagonal dashed line. If the level of agency on the horizontal axis is relatively low (i.e., you believe that the virtual other is only an agent), then the level of behavioural realism on the vertical axis must be relatively high for the 'threshold' of social presence to be reached and for social influence to occur. (Interestingly, Blascovich claims that behavioural realism is of greater importance than *photographic realism*, citing the folk wisdom of cartoonists in support.) Conversely, if the level of agency is relatively high (i.e., you believe that the virtual other is really an avatar), then an equivalent result can be achieved with a relatively low level of behavioural realism.

[12] Thanks to Jim Blascovich and Jack Loomis for several illuminating discussions about the relationship between virtual reality and film, for introducing me to the 'threshold model of social influence', and for allowing me to try out a number of 'immersive virtual environments'.

Figure 2.8: Presence: the threshold model of social influence

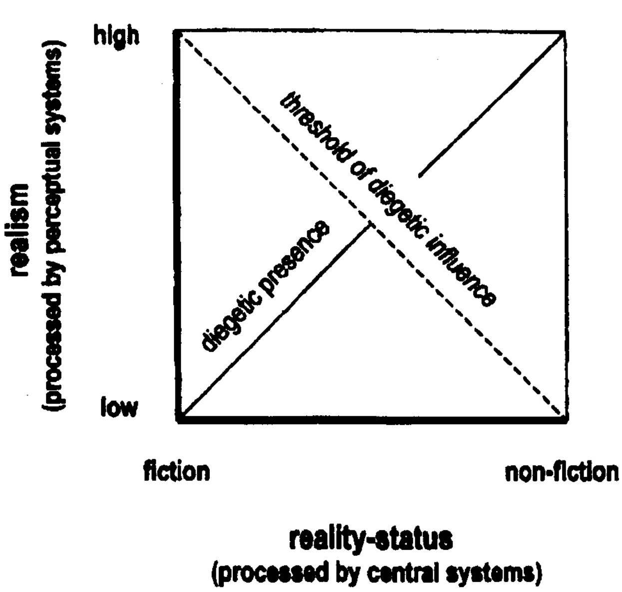


N.B. Two basic types of graph will be used in this thesis. This graph is an example of the first type: it illustrates a functional, or compensatory, relationship between two factors. Adapted from Blascovich (2002a, 2002b).

In the case of film, we are concerned with the diegetic influence, social and otherwise, of both characters and events; therefore, we must alter the scope of the threshold model's applicability (see Figure 2.9). To begin with, let us replace the factor of social presence with the factor of *diegetic presence*. Similarly, considering that Burch (1979, p.247) refers to a 'threshold of emergence' with respect to the diegetic effect, let us replace the 'threshold of social influence' with the *threshold of diegetic influence*. What about the other factors? The threshold model makes a crucial distinction between a representation's appearance on the one hand, and its referential relationship to the world on the other. First, the factor of 'behavioural realism' can be replaced with *realism* period; a continuum marked by the neutral terms 'low' and 'high'. Blascovich (personal communication) notes that realism should be thought of as a 'latent variable' in the sense that it defies straightforward measurement; it is possible, however, to gain an approximate idea of the level of realism by considering certain 'manifest variables'. From the perspective of film theory, André Bazin's (1967, 1971) view of realism was both descriptive and prescriptive: for instance, he recognized that the introduction of sound (1927), colour (1930s), and widescreen (1950s) reflected a 'general trend' towards realism, whilst arguing that film should attempt to preserve the spatial and temporal continuity of reality. In contrast, our view of realism will be purely descriptive: i.e., it will be concerned with what filmic information - including the viewing conditions - happens to 'interface' with our (modular) perceptual systems.

Second, the factor of 'agency' can be replaced with the more general factor of *reality-status*: a continuum with, say, *fiction* at the 'low end' and *non-fiction* at the 'high end' (see Grodal, 1997, pp.32-35). Once again, our view of reality-status will be purely descriptive: i.e., it will be concerned with the way in which referential relationships happen to be processed by the *(non-modular) central systems*. (This factor will be discussed in the section 2.4.) Despite the various revisions to the model, however, the crucial point is that the functional, or compensatory, relationship between the factors in question still holds. If a film's reality-status is relatively low (i.e., you believe that the film is fictional), then the level of realism must be relatively high for the threshold of diegetic presence / influence to be reached and for the diegetic effect to occur. Conversely, if the film's reality-status is high (i.e., you believe that the film is, say, a documentary), then an equivalent result can be achieved with a relatively low level of realism.

Figure 2.9: Presence: the threshold model of diegetic influence



Although Burch acknowledges that any type of film may be capable of inducing the diegetic effect, let us illustrate the threshold model by briefly considering the extreme example of 'Realist' cinema. Bazin praised the *Italian Neorealist* movement from the 1940s and early 1950s. More recent examples, however, are provided by the *Dogma 95* movement established in Denmark. The first three rules of 'The Vow of Chastity', for instance, specify that all shooting should be done on location, all sound should be diegetic (i.e., no non-diegetic music), and the camera should be handheld. Lars Von Trier's *The Idiots* (1998) is a controversial film about a group of young people - led by Stoffer (Jens Albinus) - who periodically pretend to be mentally retarded (an activity described as 'spassing'). In the opening scene of the film, the group is joined by a naïve young woman called Karen (Bodil Jørgensen) who has run away from home (see Frame 2.1). In the concluding scene, Karen must prove her commitment to the group's cause by returning to her home and 'spassing' in front of her estranged and unsuspecting husband and family (see Frame 2.2). Given that we are fully aware that the characters are played by actors and the events have been staged for the camera, why is it probable that we experience an acute sense of embarrassment on both Karen and her family's behalf?

Frames 2.1 and 2.2: Presence: *The Idiots* (1998)

In a discussion of the film, Murray Smith (2003, p.114) refers to a 'fundamental epistemological difference' between the 'literal reality of the events represented, a feature of documentary or historical representations' and 'realism, a feature of fictional representations'. How should we understand the nature of such realism (see Table 2.2)? In the case of IVEs, the photographic realism of 'virtual others' is constrained by the processing power of the rendering computer, although Blascovich would argue that this constraint is only significant in as much as it affects behavioural realism. Whether or not this is correct, a film such as *The Idiots* need not make a compromise between the two options.

(1) Photographic realism. The film's image track combines two important factors. The first factor is *indexicality*. Following Bazin's observations on the 'ontology' of the photographic image, the mechanical nature of the photographic process means that there is an indexical relationship between, say, the character of Karen and the actress Bodil Jørgensen. This relationship has significant implications for Walton's (1984) *transparency theory*: viz., we see 'through' the images in question to Karen / Jørgensen herself; that is, we are, in some sense, in the 'presence' of an actual person. The second factor is *motion*. Because 'flicker fusion' occurs at approximately fifty flashes per second and a sequence of twenty-four photographs per second is an 'evolutionarily unanticipated' phenomenon, the (modular) visual system perceives a continuous stream of light whilst failing to detect the difference between the 'discrete changes' of apparent motion and the 'continuous changes' of real motion.[13] (The importance of motion is also acknowledged by Burch.) The end-result of this 'indexicality-motion' combination is the film's capacity to capture 'the subtleties and nuances' of Karen / Jørgensen's facial and bodily expressions.[14]

(2) Behavioural realism. In a discussion of the differences between theatrical (exaggerated) and filmic (naturalistic) acting, the actor Michael Caine (1990, p.6) states: 'If today's actor emulates film, he'd be better off watching a documentary.' An example of a documentary tradition is *direct cinema* which aims to film its subjects in a relatively unobtrusive fashion. Strangely, however, given the possibility that the subjects in question may be influenced by the camera's presence, the highest level of behavioural realism may actually occur in fiction films such as *The Idiots* which are made in the *style* of direct cinema. How should we understand the impact of such behavioural realism? Following Gibson's notion of 'perceptual invariances', Peter Wuss (2002) attempts to explain the 'reality effect' of the Dogma films by proposing that films such as *The Idiots* present 'behavioural invariances' which can be 'extracted' by the viewer. From the perspective of optics, the notion of 'behavioural invariances' is potentially problematic. From the

[13] Anderson (1996, p.61) argues that the perception of motion is not due to the much-cited phenomenon of the 'persistence of vision'.

[14] Phrasing inspired by Prince (1993, p.24): 'a major source of the appeal and power of the movies lies ... in film's ability to capture the subtleties and nuances of socially resonant streams of kinesic expressions'.

perspective of the threshold model, however, the key point is that the behaviour of, say, the character of Karen can be separated in some way from her reality-status, and this behaviour must be specified (ultimately) by the film's 'ambient optic array'. According to the Fodorian account outlined above, the (modular) visual system will analyse this optic array through computational processing and produce the basic categorization, "A woman of such-and-such a description" as a shallow output, thereby telling the rest of the mind that we are in the presence of an actual person. (The description in question will only contain information that is 'phenomenologically given'.)

Having considered the factors of photographic and behavioural realism, we are in a position to challenge Walton's transparency theory. This challenge can be regarded as an application (or wielding) of *Ockham's razor*: the philosophical maxim which states that, 'Entities are not to be multiplied beyond necessity.' Once we have acknowledged that - (1) the image of Karen / Jørgensen was produced by the mechanical process of photography (indexicality); (2) the image is processed in a certain way by the visual system (computational theory); and (3) the end-result of this processing is the phenomenological experience of being in the company of an actual person (presence) - then there is nothing to be gained by postulating the entity of 'transparency'.[15]

Table 2.2: Presence: the factors of photographic and behavioural realism

	IVE	film
(1) photographic realism?	no	yes
(2) behavioural realism?	yes	yes

(3) Sonic realism. What role does the auditory system play? With respect to *sonic realism*, the film's soundtrack entails 'sonic indexicality'. Because sound recording is also a mechanical (causal) process, there is an 'indexical' relationship between Karen's voice and Jorgensen's voice; such indexicality necessarily entails motion or 'flow'. The end-result of this 'indexicality-flow' combination is the film's capacity to capture 'the subtleties and nuances' of Karen / Jorgensen's vocal expressions; the auditory system will analyse the corresponding 'sonic array' through computational processing and produce the

[15] Carroll (1996e) notes that the transparency theory does not account for either the distinction between character and actress or the physical 'detachment' between the image and its referent (cf. binoculars and microscopes).

basic categorization "A voice of such-and-such a description" as another shallow output, thereby telling the rest of the mind that an actual person is speaking. Beyond the uni-modal realm, the perceptual system as a whole will 'actively search' for correlations *between* the sensory modalities of vision and audition, especially concerning the phenomenon of lip-sync (see Anderson, 1996, pp.81-84). According to the 'processing rule' for synchrony, for instance, if Karen / Jørgensen's lip-movements (a visual event) and vocalisations (an auditory event) occur at the same time, then the two will be perceived as a single (cross-modal) event - the 'synchresis effect'. Because of the 'spatial magnetization' of sound by image, furthermore, the sound of Karen's voice will seem to come from her mouth, even though the projection and sound systems in a multiplex theatre are functionally distinct (see below). In summary, the relationship between the visual and auditory representations of Karen will produce a whole which is greater than the sum of its two parts, thereby heightening our sense of presence. (The importance of lip-sync is also acknowledged by Burch.)

How do photographic, sonic, and behavioural realism influence our response to the final scene cited above? Although the reality-status of Karen and the members of her family is low, the net-result of the factors described is that the overall level of realism with regard to both ordinary and 'spassing' behaviour is extraordinarily high (if not maximal). It is plausible, therefore, that all of the characters have sufficient diegetic presence for the threshold of diegetic influence to be reached and for the diegetic effect to occur; a possible result of the diegetic effect is the sense of embarrassment described.

□ *Immersion*

Given that presence and immersion are opposite sides of the same coin, it should be stressed that all of the factors described above will be of relevance to what follows, *and vice versa*. With respect to the threshold model, for instance, the line marked 'presence' can be replaced with one marked 'immersion'. The following discussion will be used, therefore, to bring another set of factors into the realism 'equation'. In light of this, imagine donning the 'head-mounted display' (HMD) once again. In essence, you have two types of access to the computer-generated landscape which lies before you (see Table

2.3).[16] The first type of access is *perceptual.* With regard to the visual system, the human field of view samples 180 degrees of the ambient optic array; although the display does not 'fill' your FOV, the apparatus excludes conflicting visual information relating to the room in which you are actually situated. In addition, the field of view comprises 140 degrees binocular overlap; the disparity between the left and right displays creates *stereoscopic (binocular) vision*, enabling you to see objects and events in three-dimensions. With regard to the auditory system, on the other hand, the ear-phones are capable of reproducing a section of the dynamic range (soft to loud) and frequency range (bass to treble) of human hearing, whilst the disparity between the left and right ear-phones creates *stereophonic sound*, enabling you to 'hear' objects and events in three-dimensions.

The second type of access is *enactive.* As you turn to survey the landscape and take a step forward, both your head and body movements are registered by tracking devices and translated into visual and auditory changes by a rendering computer: thus, there is a system in place which permits you to interact (in 'real time') with your surroundings, whilst allowing for feedback from both *tactile cues* (for example, the floor on which you are standing) and *vestibular/kinesthetic cues* (concerning your head and body movements respectively). Loomis (personal communication) describes this type of virtual experience as the 'ultimate equivalent configuration': i.e., there is *sensory equivalence* between the information presented to us and the information that *would* be presented if we were actually situated in the depicted environment. (The notion of *epistemic equivalence* will be discussed in section 2.4.)

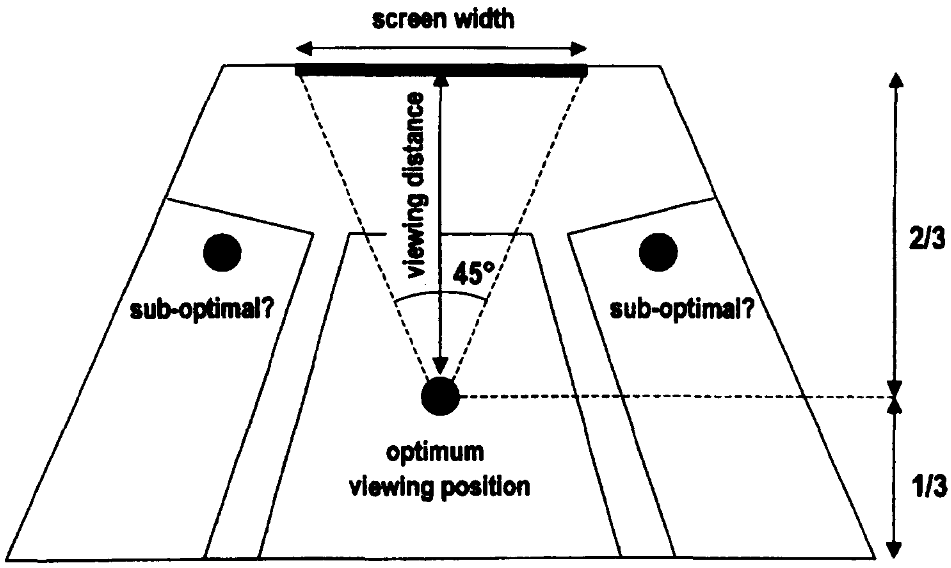
[16] Grodal (1997, pp.45-48) makes a distinction between 'perceptual access' and 'enactive access'. In order to illustrate this distinction, however, he cites video games as opposed to IVEs.

Table 2.3: Immersion: perceptual and enactive access

	perceptual / motor system		**perceptual data / motor action**
(1) perceptual access	external	(i) visual	stereoscopic vision
		(ii) auditory	stereophonic sound
		(iii) haptic (touch)	tactile cues (e.g., floor, ladder, gun)
		(iv) olfactory (smell)	X
		(v) gustatory (taste)	X
	internal	(i) vestibular (head)	vestibular cues
		(ii) kinesthetic (body)	kinesthetic cues
(2) enactive access	(i) head		head movements
	(ii) body		body movements

To what extent are *filmic environments* immersive in the way described? In a consideration of film as a type of 'virtual display', Loomis (1992, p.592) argues that the observer is more likely to experience 'distal attribution'; that is, the feeling of being in front of, but detached from, a non-immersive *virtual environment* (VE) (see Figure 2.10). Loomis states: 'even when an observer views a movie from the proper viewing point in the theater, residual cues (e.g., binocular disparity signalling screen flatness, visible features of the theater that surround the screen) and the lack of contingency upon the observer's head movements provide sensory information that a movie is being viewed.' From the perspective of Fodorian modularity, however, to what extent are these 'residual cues' significant: do any 'visual properties' of the viewing situation 'reliably predict' a film's virtual status? According to *Gournerie's paradox*, for instance, sitting anywhere other than the 'optimum' viewing position will not significantly distort the projected image (Anderson, 1996, p.68). In a related fashion, binocular disparity is only effective for objects at a distance of less than fifteen feet from the observer; therefore, the distance between the viewer and the screen will minimise any 'flattening' of the image, whilst the viewer's head-movements will not make any discernible difference (ibid., p.66). Beyond the screen, the visibility of the theatre will be minimised by the lack of illumination; in any case, the (modular) visual system is effectively 'blinkered', processing different elements of the environment in isolation from the others. All of these points will be developed below.

Figure 2.10: Immersion versus distal attribution: the viewing situation [17]



N.B. Visual angle = $2\left(\text{arc tan}\left[\frac{\text{screen width}/2}{\text{viewing distance}}\right]\right)$

Given the possible insignificance of the residual cues cited by Loomis, might filmic environments be immersive after all? Let us answer this question by considering a film example which may create an extraordinary sense of *visual immersion*. In a sequence from Terrence Malick's World War II / action film *The Thin Red Line* (1998), American soldiers ascend a hill in Guadalcanal in an attempt to overcome a Japanese post at the hill's summit: Private Bell (Ben Chaplin) informs three of his fellow Privates that he will go on a lone reconnaissance mission to ascertain the state of play (see Frames 2.3 and 2.4). The camera follows him as he crawls through the long grass. Given that we are fully aware that we are viewing a film, why might we feel that we are actually accompanying Bell on his mission?

[17] The information about the standard layout of a theatre is available from the Dolby website. The calculation for visual angle is cited by Lombard (1995), p.319.

Frames 2.3 and 2.4: Visual immersion: *The Thin Red Line* (1998)

Considering that our *visual access* to the environment in question is partially determined by the nature of the viewing conditions, let us consider some of the differences between viewing the sequence in a modern multiplex theatre and viewing a hypothetical *3D-IMAX* version of the sequence on the one hand, and a standard *televisual* version on the other. Although televisual technology is becoming increasingly sophisticated - for example, see the recent experiments in 'immersive television' - for the sake of argument, let us assume that the televisual viewing experience involves a standard television set positioned in the corner of an illuminated room in the home.

(1) Visual access: viewing conditions. In the case of vision, the everyday notions of 'quantity' and 'quality' correspond to the factors of *salience* and *definition* respectively (see Table 2.4). First, the most obvious feature which would distinguish both the IMAX and filmic viewing experiences from their televisual counterpart concerns the process of projection. All other things being equal, the 3D-IMAX image would occupy a larger proportion of our field of view than the filmic image, and the filmic image would occupy a larger proportion of our field of view than the televisual image (as determined by the measure of 'visual angle'). Conversely, the widescreen aspect ratio of 2.35:1 would approximate the shape of our field of view more closely than either the IMAX ratio of 1.435:1 or the standard televisual aspect ratio of 1.33:1 (see Wollen, 1993). In light of these two inter-related properties, both the IMAX and filmic images would maximise the salience of the hillside environment to a greater extent than the televisual image, producing

salience of the hillside environment to a greater extent than the televisual image, producing a higher level of what Loomis would describe as *equivalent visual information*. Conversely, the lack of illumination would incidentally play a significant role in minimising the salience of the theatrical environment in which we are actually situated, thereby producing a lower level of *non-equivalent visual information*. (This inverse relationship will be discussed again in section 2.5.)

Second, both IMAX and filmic projection would produce images of higher brightness, colour, and resolution, thereby maximising the definition of Private Bell's body as he crawls through the long grass in the foreground, and the texture elements of the hill's summit (the Japanese post) in the background. (In a strict sense, of course, both salience and definition would be dependent on all of the elements described.) Considering these basic differences, it is probable that both the 3D-IMAX and filmic images would activate the various modules comprising our visual system to a greater extent than their televisual counterparts, resulting in the production of 'equivalent' shallow outputs of a greater 'weight' on the one hand, and 'non-equivalent' shallow outputs of a lesser 'weight' on the other; the net-result being that the periphery of the mind would tell the central workspace that we are actually present ('immersed') in the hillside environment behind the 'magic window'.

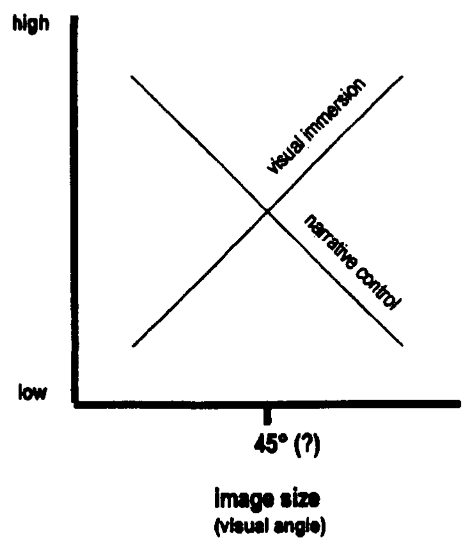
Table 2.4: Visual immersion: the factors of salience and definition

	measure	3D-IMAX	film	television
(1) salience ('quantity') *	image size (visual angle)	60-120°	45°	16.6°
	image shape (aspect ratio)	1.435:1	2.35:1	1.33.1
(2) definition ('quality')	brightness range (contrast ratio)	full	full	limited
	colour range (colour number)	full	full	limited
	resolution (pixel number)	high	high	low

* Also see the exclusion of 'non-equivalent' visual information.

At this point, however, it should be pointed out that Malick's film must balance visual immersion with *narrative control* (see Figure 2.11). The sequence in question, for instance, is intercut with 'mental images', or 'memories', of Private Bell's 'girl back home'. Although the IMAX version might have the upper hand on its filmic counterpart in terms of overall salience and definition, the size and shape of the image would not lend itself to the telling of the film's narrative: the close-ups of Bell and co. would be impossible, and we would have to look up, down, and to the sides of the screen in order to gather all of the visual information presented, necessitating a lower editing rate (see Wollen, 1993). Many of the criticisms originally aimed at widescreen and challenged by Barr (1963), therefore, can be used to argue the case for (widescreen) film over IMAX. (Aspects of film narrative will be discussed in sections 2.3 and 2.5.)

Figure 2.11: Visual immersion versus narrative control: the factor of image size



N.B. As stated previously, two basic types of graph will be used in this thesis. This graph is an example of the second type: it illustrates an inverse relationship between two factors. A similar graph could be drawn for the relationship between visual immersion and image quality.

Beyond the natural partnership of salience and definition lies the miscellaneous factor of *dimensionality*. In this particular case, one might assume that the filmic and televisual versions of the sequence would be on equal terms as both would employ a two-dimensional screen (see Table 2.5). In actual fact, however, the filmic version might have the upper hand on its televisual counterpart once again: for instance, the brightness, colour, and resolution of the projected image would 'maximally conserve' the Gibsonian depth cues of motion parallax, texture gradients, and occlusion, thereby heightening the contrast between the foreground and background elements described above. According to Marr's (1982) account of depth perception, the absence of stereoscopic vision (cf. IVEs) would be compensated by modules which process the depth cues in question (see Messaris, 1994, p.52). Even more strangely, perhaps, the filmic version might have the upperhand on the hypothetical *3D-IMAX* version. If the module for processing stereopsis was activated, for example, it would 'override' and 'suppress' all other depth processing, resulting in the curious 'flattening' of the hillside environment (see Anderson, 1996, pp.65-75). This leads us to the paradoxical conclusion that the 'two-dimensional' filmic version might have greater dimensionality than the allegedly 'three-dimensional' IMAX one.

Table 2.5: Visual immersion: the factor of dimensionality (psychological versus simulated depth)

	measure	**3-D IMAX**	**film**	**television**
(3) dimensionality	conservation of depth cues	maximal	maximal	minimal
	override of other depth processing?	yes	no	no

(2) Visual access: method of filming. Having considered the role of the viewing conditions, let us turn to the way in which our visual access to the filmic environment is manipulated by Malick himself. Bazin argues that the film-maker should use the deep focus / long take, thereby preserving the spatial and temporal continuity of reality, whilst allowing for ambiguity of meaning and freedom of interpretation. As stated previously, however, we are concerned with what information happens to 'interface' with the human visual system. First, Gibson claims that the human visual perspective is based on the 'earth-air interface'. In this light, the sequence presents the environment from a position which could be occupied by an American soldier: the camera is positioned at *eye-level* and in *proximity* to the action, the lens frequently pushing against the blades of grass. The closer the camera, the greater the salience of the environment's 'affordances' and the greater the 'motion parallax' between foreground and background elements. Second, because human vision is not panoramic, our perception of the real world is dependent on a 'succession of partial views' (see Anderson, 1993, p.61). In this light, the sequence presents various *establishing shots* which enable us to form what Julian Hochberg (1978) would describe as a 'cognitive map' of the environment.[18] Given that we have been successfully oriented to the hill's summit (the goal of the action), the sequence is free to present us with an array of *front*, *reverse*, and *side* views: in the Ptolemaic universe of *The*

[18] The notion of a 'cognitive map' is rejected by Gibson (1979, pp.198-200). Presumably, this map is held in what Baddeley (1995) describes as the *visuo-spatial sketchpad* of working memory: the storage of object representations and spatial relations may be dependent on the ventral ('what') and dorsal ('where') pathways respectively.

Thin Red Line, then, we remain stationary whilst the hillside environment revolves around us. In conclusion, one could argue that contrary to Bazinian realism, the method of film-making employed by Malick provides a greater approximation of the soldier's (visual) experience.

(3) Enactive access. Although we cannot interact with the filmic environment in a strict sense, the sequence is capable of simulating interaction in various ways. Gibson's (1979) ecological approach places considerable emphasis on a moving observer: for instance, *ambient vision* is a consequence of the movement of the head in relation to the body, whilst *ambulatory vision* is a consequence of the movement of the body in relation to the environment. In the sequence, the camera 'specifies' *head movements* through the panning shot: Gibson notes that such shots may result in 'panoramic' vision. Similarly, the camera 'specifies' *body movements* through the tracking shot: Gibson argues that the tracking shot is preferable to the zoom shot because the latter cannot 'display the deletion or accretion that occurs at occluding edges' (p.298). Indeed, in certain circumstances we may actually feel as if we are moving through the filmic environment.

In addition to camera position and movement, interaction can be simulated through editing. The most obvious example is provided by *deictic gaze behaviour* (see Carroll, 1996d, and Persson, 2003). Our natural tendency to follow the gaze of another person to its 'target object' can be duplicated by point-of view editing: in the sequence, for instance, a close-up of an American soldier's face (the point/glance shot) may be followed by a long shot of what that soldier is looking at - say a Japanese soldier in the distance (the point/object shot) To use Loomis's terms, there is 'sensory equivalence' between the optical information presented to us and the information that *would* be presented if we were actually interacting with the depicted environment. Intriguingly, IVE researchers at UCSB have been effectively concerned with the opposite problem: viz., how realistic does a 'virtual other' have to be for the subject to actually follow its gaze to a target object?[19] In this case, the possibility of genuine interaction may be ruled out by an insufficient level of photographic and behavioural realism.

(4) The role of the kinesthetic system. Despite film's reputation as a bi-modal medium - see, for example, the journal title *Sight and Sound* - the above observations suggest that the *kinesthetic system* often plays a role in film viewing, bringing *kinesthetic cues* into the realism equation. Gibson describes several experiments in visual kinesthesis -

[19] See experiment by Tim German and Jeff Niehaus, Department of Psychology, UCSB.

for example, the 'gliding room' and the 'haunted swing' - in which the 'pseudoenvironment', rather than the subject, undergoes locomotion; significantly, the real 'surface of support' must be hidden from view in order for the effect to occur. With respect to Malick's film, a particularly salient example of visual kinesthesis is provided by one of the opening sequences: a boat transports the American soldiers to the island, moving up and down through the waves; as the camera travels alongside the boat (presumably positioned in an adjacent craft?), we may experience a sensation akin to sea-sickness. The larger the projected image and the lower the visibility of the theatrical environment, the more powerful the sensation; the hypothetical IMAX version cited above, for instance, might be 'uncomfortably' compelling. How should we explain visual kinesthesis in Fodorian terms? Because the visual system is dominant, it will analyse the film's optic array and deliver shallow outputs to the rest of the mind which state, incorrectly, that we are actually moving; in the event of a disagreement, these outputs will over-ride the conclusions of the kinesthetic system, whose outputs state, correctly, that we are actually stationary.

* * *

So far, we have been concentrating on visual immersion. To what extent, though, are filmic environments *sonically immersive*? To begin with, its seems unlikely that any 'auditory properties' of the viewing (or 'listening') situation 'reliably predict' the soundtrack's virtual status. As Michel Chion (1994, p.67) observes, there is no auditory equivalent to the screen: for sound 'there is neither frame nor preexisting container'. (Indeed, our relationship to sound does not seem prone to the same degree of scepticism with respect to either the paradox of representation or the paradox of fiction.) In light of this, let us turn immediately to a film example which may create an extraordinary sense of auditory immersion. In the concluding sequence of Michael Mann's *Heat* (1995), policeman Vincent Hanna (Al Pacino) and bank robber Neil McCauley (Robert De Niro) shoot it out on the outskirts of a busy airfield (see Frames 2.5 and 2.6). Given that we are fully aware that we are viewing a film, why might we feel as if aeroplanes are actually taking off and landing all around us?

Frames 2.5 and 2.6: Auditory immersion: *Heat* (1995)

Our *auditory access* to the airfield environment would be heavily influenced by the 'listening' conditions; given that a consideration of 3D-IMAX will not allow for any illuminating (favourable) comparisons in this particular instance, let us turn to the differences between film and television alone, once again assuming certain extremes for the sake of argument.

(1) Auditory access. In the case of sound, the everyday notions of 'quantity' and 'quality' also correspond to the factors of *salience* and *definition* - or 'volume' and 'tone'- respectively (see Table 2.6). Whereas a standard television set only transmits a single channel of sound, the standard sound system in a multiplex theatre transmits '5.1' channels. The five main speakers would produce sounds of a greater dynamic range (soft to loud), thereby maximising the salience of the aeroplanes and producing a higher level of what Loomis might describe as *equivalent auditory information*. In a related fashion, the speakers would produce sounds of a full frequency range (bass to treble), thereby maximising the definition of auditory 'details'; as each aeroplane either took off or landed, our auditory system would use frequency variation - relating to the roar of the aeroplane's engine - in order to produce the basic categorization "aeroplane" as a shallow output. (In a strict sense, however, both factors would be a function of the dynamic and frequency ranges.) Considering Chion's remark, there would be no permanent example of *non-equivalent auditory information*. A temporary example would be the sound of another

viewer talking or crackling their sweet wrappers; here, the constraint in operation is social as opposed to technological.

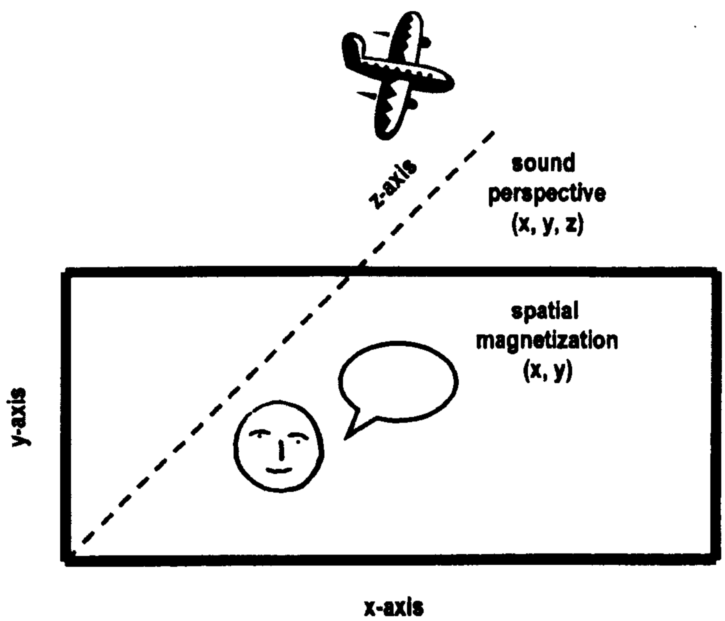
Table 2.6: Auditory immersion: the factors of salience and definition

	measure	film	television
(1) salience ('quantity')	dynamic range (soft to loud)	loud: 110 dB	loud: 70 dB
(2) definition ('quality')	frequency range (bass to treble)	full: 20 Hz - 20,000 Hz	limited: 100 Hz - 7,000 Hz

What about the miscellaneous factor of *dimensionality*? Although the standard television set transmits mono sound, televisual sound would benefit from the process of *psychological localization* (see Figure 2.12). Given the viewing differences described above, however, this process would be exploited more effectively by the standard sound system in a multiplex cinema. The first type of psychological localization would be dependent on the synchresis effect and the phenomenon of spatial magnetization described above. In the well-known diner scene from earlier in the film - widely publicised as the first time that Pacino and De Niro appear on screen together - the sound of Hanna's and McCauley's voices would seem to come from their mouths, even though the projection and sound systems are functionally distinct. Similarly, the sounds of the aeroplanes in the final scene would seem to follow their trajectories across the screen. The second type of psychological localization would be produced by sound perspective: manipulations of volume would give the impression that the aeroplanes were either approaching or receding, a loud sound indicating proximity and a soft sound indicating distance.[20]

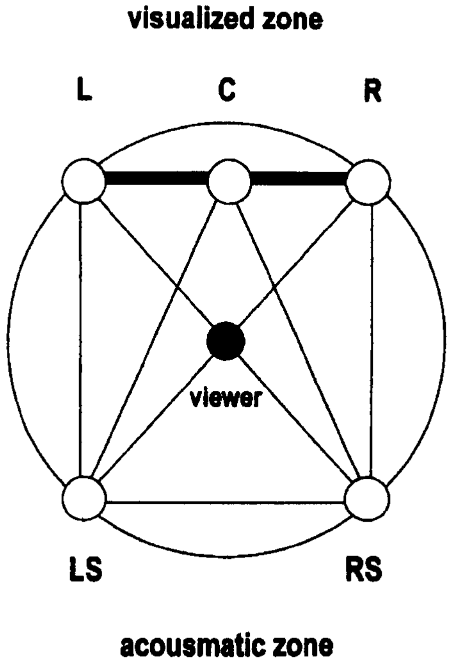
[20] Both spatial magnetization and sound perspective may be dependent on the laws of *gestalt psychology*, providing us with possible examples of 'top-down processing'.

Figure 2.12: Auditory immersion: the factor of dimensionality (psychological localization)



In contrast to television, however, the standard sound system in a multiplex theatre is also capable of exploiting *real localization*; in this respect, moreover, filmic environments may have the upper hand on IVEs (see Figure 2.13). Three of the main speakers are positioned behind the screen: a central speaker transmits the main sounds (major dialogue, sound effects, and music), whilst left and right speakers transmit *stereophonic sound* (all of the aforementioned sounds, along with minor dialogue). At the sides and rear of the theatre, on the other hand, left and right speakers transmit *surround sound* (ambient and atmospheric sound effects). Presumably, this setup obeys what Williams (1985) describes as the 'hierarchy of sonic importance'. In light of this, a consideration of the auditory system provides us with a vivid example of how the mind may actually calculate immersion. Say one of the aeroplanes in the sequence flies from the left speaker at the back of the theatre to the right speaker at the front. Using the processing rule that an object will continue to move in the same direction, our auditory system will compare the time difference between the roar of the aeroplane's engine reaching each ear and the intensity difference between the roar at each ear, in order to produce the basic localization "moving from back left to front right" as a shallow output. In a related fashion, a consideration of the auditory system demonstrates that an aeroplane can be 'acousmatized' at the back of the theatre, before it becomes 'visualized' at the front of the theatre, thereby contributing to the impression of 'magic-window reality'.

Figure 2.13: Auditory immersion: the factor of dimensionality (real localization)



N.B. The bold line marks what Chion describes as the 'visualized zone' (i.e., the screen) although the front three speakers are also capable of transmitting both offscreen and non-diegetic sound; the remaining area comprises the 'acousmatic zone' (primarily offscreen sound). The lines between the five speakers - including the bold line - illustrate the various panning options which can be employed by the film-maker.

(2) The role of the haptic system. The discussion of visual immersion was used to suggest that the kinesthetic and vestibular systems occasionally play a role in film viewing; similarly, a discussion of auditory immersion can be used to suggest that the *haptic system* also plays some sort of role, bringing *tactile cues* into the realism equation. Although the sense of 'touch' actually comprises pressure, temperature, and pain, in this particular instance we are concerned with pressure alone; indeed, hearing - which is ultimately based on pressure - has been described as 'feeling at a distance' (see Gleitman et al. 1991, p.170). In the sound system described above, a sixth speaker positioned behind the screen (the '.1' channel) specialises in bass sounds: because the frequency will be sufficiently low (say, 20 to 120 Hz) and the volume sufficiently high (say, 120dB?), we may actually feel the vibrations of the 'aeroplanes' through the floor and seats of the theatre, a phenomenon which recalls the 1970s experiments in *Sensurround*.[21]

[21] The first Sensurround film was *Earthquake* (1974).

□ *Conclusion*

A film's diegetic effect can be (partly) explained in terms of the phenomenological experiences of presence and immersion; in turn, these experiences can be (partly) explained in terms of the impact of the shallow outputs produced by Fodorian modules on the rest of the mind. In the case of presence, film may have the upper hand on immersive virtual environments (IVEs) in terms of utilising both photographic and behavioural realism. Immersion, on the other hand, is not a case of all or nothing: if IVEs are at the high end of the 'immersion spectrum' and televisual environments are at the low end, then filmic environments may be situated somewhere in the middle, providing a greater approximation of our perceptual and enactive access to an IVE than might be expected, whilst actually exceeding IVEs in terms of auditory dimensionality. The impact of a drama film such as *The Idiots* may be primarily dependent on presence, whereas the impact of a war / action film such as *The Thin Red Line* may be primarily dependent on immersion. Either way, a similar set of factors will be involved in both cases: for instance, the level of Karen's presence in *The Idiots* will vary according to the size of the screen and the darkness of the theatre,[22] whilst the level of our immersion in the hillside environment of *The Thin Red Line* will be partly dependent on the degree of photographic and behavioural realism.

It seems fitting to conclude this discussion with a question: namely, will the future see any advance in terms of a film's diegetic effect? With respect to presence, for instance, fiction films may be already capable of capturing more naturalistic performances than even the direct cinema tradition of documentary film-making. With respect to immersion, on the other hand, we must consider the following factors. Fiction films must balance (interactive) spectacle with (non-interactive) narrative; more visually immersive media such as 3D-IMAX have a number of limitations; the standard sound system in a multiplex theatre has already reached a high level of sophistication; the impact of adding the two remaining senses - namely, smell and taste - is likely to be negligible;[23] and, finally, genuine interaction might be neither possible nor desirable. On top of all this, there is the possibility that the human perceptual system has stopped evolving: in other words, once a

[22] Lombard (1995) claims that viewers respond more positively to televisual images of people when those images are presented on larger screens, or when the viewer is positioned closer to the screen.

[23] For example, Burch (1979, p.246) cites the failure of the 1960s experiments in *Smell-O-Vision*. The first Smell-O-Vision film was *Scent of Mystery* (1960).

successful 'interface' has been achieved, there may be nowhere left to go. At only one hundred years old, then, film may be the ultimate virtual experience after all.

2.3 ANOTHER TYPE OF MODULARITY

(a) Cognizing the world: Darwinian modularity [24]

How should we understand our cognitive relationship to the world? The title of Fodor's 1983 work *The Modularity of Mind* is misleading for it implies that, on his view, the mind is largely, or even entirely, modular. An excursion beyond the front cover, however, reveals that the term 'modularity' is only applicable to the perceptual systems of the mind; the systems which comprise the central workspace are emphatically *non*-modular. Unfortunately, the problems do not end with the confusion surrounding the title: Fodor's account of the central systems is dangerously close to the view of the mind as a 'blank slate' or 'general-purpose processor' (*tabula rasa*) - originally proposed by the seventeenth century British empiricists John Locke and David Hume, and standardly adopted by the social sciences.

In recent years, this view of the mind has been challenged by the approach of evolutionary psychology advanced by Jerome Barkow, Leda Cosmides, and John Tooby (1992) in *The Adapted Mind*, and endorsed by writers such as Steven Pinker (1997) in *How the Mind Works* and Henry Plotkin (1997) in *Evolution in Mind.* The approach of evolutionary psychology can be regarded as a 'New Synthesis' of computational psychology and evolutionary theory: first, the mind is composed of a large number of 'special-purpose' computational modules (*tabula cognitiva*); and second, these modules evolved by natural selection to solve the adaptive problems encountered by our hunter-gatherer ancestors in the Pleistocene.[25]

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[24] With respect to film theory, Darwinian modularity is discussed by Anderson (1996, pp.37-43) under the rubric of 'capacities'.

[25] Thanks to Leda Cosmides and John Tooby at the Center for Evolutionary Psychology, UCSB, for generously giving me their time to answer my questions, for allowing me to participate in a graduate course on evolutionary psychology, and for inviting me to present a paper at their weekly graduate seminar on the same subject.

(i) Specific examples

In order to illustrate the nature of 'psychological adaptations', Tooby and Cosmides (1992, pp.55-61) describe the adaptations which comprise the vertebrate eye and visual system; considering the above discussion, these adaptations are instances of Fodorian modules. Significantly, however, Cosmides and Tooby (1992, p.165) also propose that many central capacities are modular in nature.[26] Their main research field is the domain of social reasoning; in particular, they propose that there is a *cheater detection module* (CDM) for detecting cheaters in social exchanges. Much of Cosmides and Tooby's research (e.g., 1997) is based on the Wason-selection task (see Figure 2.14). In this task, subjects must turn over certain cards in order to test a certain rule. In a standard task, only 25 per cent of subjects give the correct answer. When the task is concerned with social exchanges where one person accepts a benefit without satisfying a requirement, however, 75 per cent of subjects give the correct answer. In this case, the subject should experience a *cognitive* 'pop-out effect'. (The failure of the remaining 25 per cent is attributed to experimental error as opposed to a faulty CDM.)

Beyond the perceptual realm of recognizable and localizable objects and events, we can think of the world as comprising a number of different levels which, from the bottom upwards, are reflected by the academic disciplines of physics, biology, psychology, sociology, and so forth; each of these levels raises a key question which must be answered. Correspondingly, many theorists believe that we come into the world equipped with a 'folk understanding' of the physical, biological, psychological, and social reality in which we live; to use Dennett's (1987) term, this understanding enables us to take a variety of appropriate 'stances' to the different aspects of our immediate environment.[27]

(1) Physical reality: What is the nature of physical objects? It is plausible that there is a module for 'folk physics' which enables us to take a 'physical stance' to moving objects. This capacity involves the attribution of certain physical laws according to a 'theory of bodies'. *(2) Biological reality: What is the nature of biological objects?* A module for 'folk biology' enables us to take a 'biological stance' to plants and animals.

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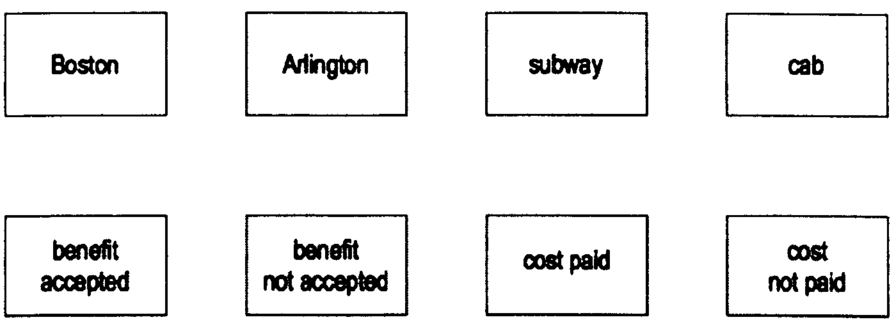
[26] My distinction between Fodorian modularity and Darwinian modularity was informed by Steen (1997) who claims that there are 'two quite convincing levels of functional specialization'.

[27] With respect to the following list, Dennett (1987) specifically proposes the physical stance and the intentional stance. In addition, he proposes that we can take a *design stance* to human-made tools and a *contingency stance* to contingent relationships in the world.

This capacity involves the attribution of some hidden 'essence' according to a 'theory of nature'. *(3) Psychological reality: What are the intentions of psychological agents?* A module for 'folk psychology' enables us to take the 'intentional stance' to fellow human beings. This capacity involves the attribution of epistemic mental states according to a 'theory of mind'. *(4) Social reality: What are the implications of social exchanges* *__between__* *psychological agents?* A variety of modules - including the CDM - enable us to take a 'social stance' to certain types of exchange with fellow human beings. *(5) Emotional reality: What is the emotional significance of objects and events?* It is plausible that there is an array of modules for the appraisal of the emotional significance - or the 'direct perception' of Gibsonian 'affordances' - which enable us to take an 'emotional stance' to all of the above: namely, objects, plants and animals, individual agents, and groups of agents.

Figure 2.14: Wason-selection task: standard (top); social exchange (bottom)



From Cosmides and Tooby (1997).

(ii) General properties

How should we understand the general properties of the central capacities in question? To begin with, there is a distinction to be made between mental representations on the one hand, and the computational mechanisms which process those representations on the other. In light of this, Richard Samuels (2000) describes two possible scenarios. According to the notion of *Chomskian modularity*, the mind comes equipped with 'systems of mental representations' alone: in the case of language, the relevant system is described as a 'universal grammar' (see Chomsky, 1975).[28] According to the notion of *Darwinian modularity*, on the other hand, the mind comes equipped with both systems of mental representations and 'special-purpose' computational mechanisms for processing those representations. Samuels argues that many evolutionary psychologists - including Cosmides and Tooby - fail to distinguish between the view that the mind is a general-purpose processor which has access to Chomskian modules and the view that the mind is a collection of Darwinian modules. In order to set up a marked contrast with Fodor's account of the central systems, let us assume that the latter view is correct.

Apart from operating outside the realms of perceptual and language-processing systems, how are Darwinian modules similar to, and different from, Fodorian modules? Once again, this question can be answered by considering two basic perspectives (see Table 2.7). *(1) A functional perspective.* Starting with the key similarities, Darwinian modules seem to be encapsulated from - and impenetrable to - our existence beliefs: the CDM, for instance, is apparently oblivious to the artificial nature of the Wason-selection task. In a related fashion, Darwinian modules operate in a fast and mandatory fashion: hence, the cognitive 'pop-out effect' described above. The key difference is that Darwinian modules are not encapsulated from - and impenetrable to - *all* epistemic mental states: it is plausible that the CDM has access to information from both the perceptual systems and memory, and that it is influenced, to a greater or lesser extent, by our background knowledge. *(2) A neurobiological perspective.* Although it is reasonable to assume that Darwinian modules are 'associated' with fixed neural architecture, it is probable that this architecture is physiologically distributed and exists at a *microscopic scale*; i.e., above the level of the individual cell but below the level psychophysically detectable by current brain imaging techniques - Dennett (1991, p.210) suggests that neural circuits will be forever invisible to neuroscientists. Despite some evidence of 'dissociations', therefore, the CDM must be analysed primarily at a functional, as opposed to a neurobiological, level of explanation.

[28] Chomsky (1975) proposes that that there is a *language-acquisition device* (LAD); more recently, Pinker (1994) has described the capacity in question as the *language instinct*.

Table 2.7: Darwinian modularity (e.g., Barkow, Cosmides, and Tooby, 1992)

	property	description
(1) functional	questions * (domain)	mind-reading / emotional appraisal: (i) intentions?; (ii) significance?
	computational character / default mode	partial encapsulation / real intentions and real significance
	answers (outputs)	shallow: (i) intentional / (ii) emotional stances
(2) neurobiological	neural architecture	circuits: micro-scale; not detectable

* The evolutionary-ecological approach can be regarded as a complementary perspective.

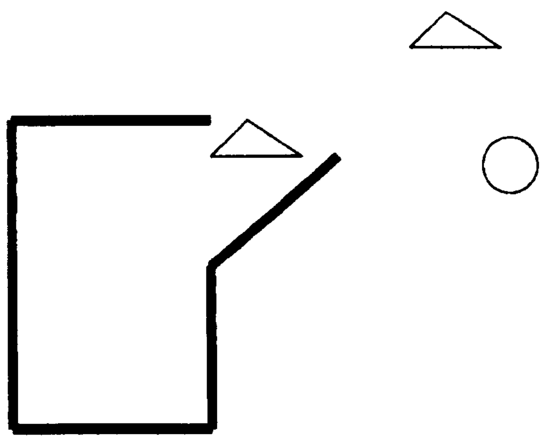
(b) Cognizing the cinema: regarding-as (type II)

Having outlined our cognitive relationship to the world, how should we understand our cognitive relationship to the cinema? In order to answer this question, let us turn our attention to two possible examples of Darwinian modules which are of obvious relevance to film viewing: namely, those modules which underlie, and give rise to, the intentional and emotional stances. Although this project is primarily concerned with the emotional stance, let us begin by considering the intentional stance, regarded by many - including Fodor (1992) - as the best example of a central capacity which is modular in nature.

(i) Taking the intentional stance

Taking the intentional stance to the people in our environment can be understood in terms of *mind-reading*. Simon Baron-Cohen (1995) describes four mechanisms which comprise our 'mind-reading system'. Let us briefly describe each of these mechanisms in turn, before turning to a particular film example. The first mechanism is the *Intentionality Detector* (ID) (see Figure 2.15). The ID is concerned with volitional mental states and processes *dyadic representations* of the form "agent-**wants**-object". In particular, the ID is sensitive to movement, especially self-propelled movement (see Premack, 1990). In order to illustrate this fact, Baron-Cohen cites a well-known film by Heider and Simmel (1944) which features geometrical shapes moving in and out of a container.[29] The two found that viewers tended to describe the shapes in intentional terms: for example, "The triangle **wants** to escape from the container." As stated previously, the importance of movement is acknowledged by Burch (1979) in his discussion of the diegetic effect. Presumably, the property of movement is sufficient to give the shapes both presence and influence. (Considering that the ID is closely related to our visual system, it is a potential candidate for a Fodorian module.)

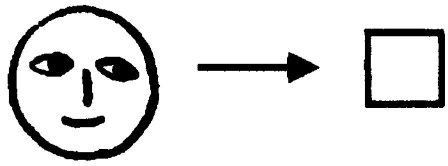
Figure 2.15: The Intentionality Detector (ID)



The second mechanism is the *Eye-Direction Detector* (EDD) (see Figure 2.16). The EDD is concerned with perceptual mental states and processes *dyadic representations* of the form, "agent-**sees**-object". In particular, it is sensitive to eye-like stimuli, detects the direction of eye-movements, and treats a sustained gaze as a sign of interest. Significantly, our capacity to detect the direction of eye-movements provides us with a further example of *regarding-as (type I)*. Considering that the EDD is contained within the visual system - and is presumably 'informationally encapsulated', and so forth - it is an obvious candidate for a Fodorian module. In order to observe the 'necessity and temporal instantaneity' of this module, we can simply take another look at Wittgenstein's example of the 'picture-face'; all we need to add is a pair of clearly defined eyes and a target for the gaze.

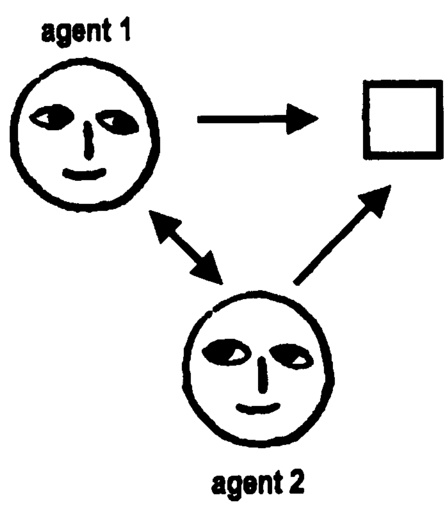
[29] Heider and Simmel's film has been used in recent experiments by Blascovich et al.

Figure 2.16: The Eye-Direction Detector (EDD)



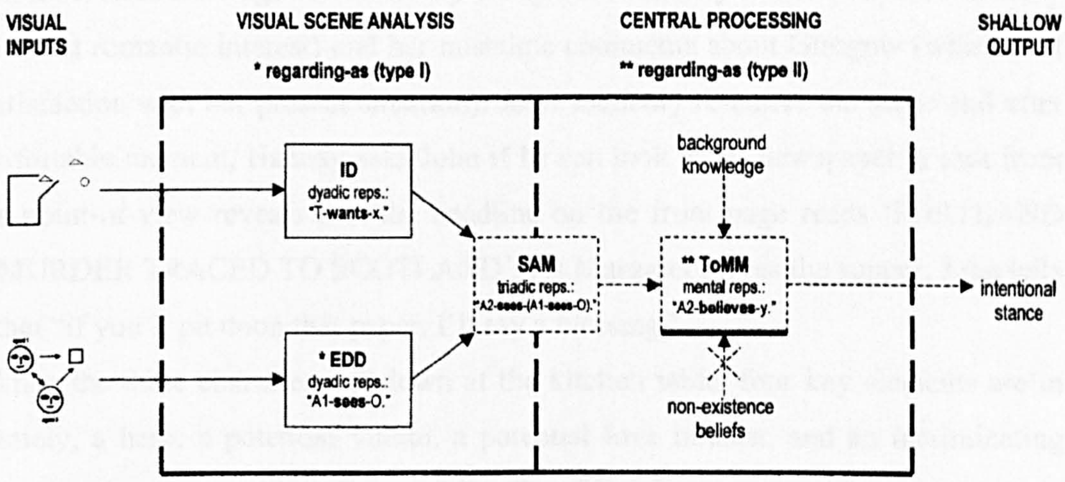
The third mechanism is the *Shared-Attention Mechanism* (SAM) (see Figure 2.17). SAM is concerned with shared mental states and processes *triadic representations* of the form "agent 1-**sees**-(agent 2-**sees**-object)" or, if the two agents are looking at each other, "agent 1-**sees**-(agent 2-**sees**-agent 1)". Although Baron-Cohen assumes that one of these agents is oneself, presumably the same mechanism is employed when we observe two people paying attention to and discussing an object of interest. (Considering that SAM is located 'outside' the perceptual systems - in the central workspace of the mind - it is a possible candidate for a Darwinian module.)

Figure 2.17: The Shared-Attention Mechanism (SAM)



The fourth and final part of the mind-reading system is the *Theory-of-Mind Mechanism* (ToMM) - inspired by Alan Leslie (1994) (see Figure 2.18). ToMM is concerned with epistemic mental states and processes *mental representations* of the form "agent-**attitude**-proposition". Many theorists argue that a theory of mind - otherwise known as folk psychology - provides us with the best way of making sense of another person's behaviour. A man walks into a bar. Why? Because he *believes* that the bar sells alcohol, he *desires* some liquid refreshment, and he *intends* to buy a drink. Of course, we could be wrong - the man may intend to use the public telephone - but having some idea about a person's mental states is usually better than having none at all. Considering that ToMM lies in the central workspace of the mind, receives information from all of the three mechanisms described (possibly via SAM), and deals with epistemic mental states, it is an obvious candidate for a Darwinian module. The key question is: how does ToMM - and the mind-reading system as a whole - operate in the case of watching film characters on the screen and how does this operation relate to the Wittgensteinian notion of 'seeing' described previously?

Figure 2.18: The mind-reading system



Intriguingly, Dennett (1987, p.48) illustrates the intentional stance by appealing to the ritual of film viewing: 'watching a film with a highly original and unstereotypical plot, we see the hero smile at the villain and we all swiftly and effortlessly arrive at the same complex theoretical diagnosis.' Following Dennett's example, let us illustrate the final three mechanisms of Baron-Cohen's mind-reading system by considering a short sequence from Alfred Hitchcock's *The 39 Steps* (1935). By way of introduction, the sequence in question brings together two narrative scenarios (for a discussion of narrative film, see Bordwell, 1985). *Narrative scenario 1* is based loosely on the original novel by John Buchan. Richard Hannay (played by Robert Donat) is a young Canadian renting a flat in Portland Place, London. He is befriended by, and offers shelter to, a beautiful female spy who is murdered by an unknown assailant in the middle of the night. Following a tentative lead, Hannay flees to the Scottish Highlands, effectively on the run for a crime he did not commit.

According to Hitchcock, *narrative scenario 2* was 'inspired by an old story about a South African Boer, a black-bearded man, very austere, with a very young, sex-starved wife' (Truffaut, 1986, p.122). After narrowly escaping from the police, Hannay seeks shelter at a cottage owned by an old crofter and his young wife. To begin with, Hannay meets the crofter John (played by John Laurie); their introductory conversation reveals John to be both hostile and mercenary. When the crofter's wife Margaret (Peggy Ashcroft) enters the scene, the *schema* of the possessive and jealous husband is brought into play as Hannay's innocent enquiry "Your daughter?" is met with the stern, abrupt reply "My wife." Conversely, when John temporarily exits the scene, the schema of the lonely wife trapped in a loveless marriage is evoked by Margaret's friendly attitude towards Hannay (which hints at romantic interest) and her nostalgic comments about Glasgow (which hint at a dissatisfaction with her present situation). John suddenly re-enters the scene and after an uncomfortable moment, Hannay asks John if he can look at his newspaper: a shot from Hannay's point-of-view reveals that the headline on the front page reads 'PORTLAND PLACE MURDER TRACED TO SCOTLAND'. As Margaret serves the supper, John tells Hannay that "if you'll pit doon that paper, I'll say a blessing."

When the three characters sit down at the kitchen table, four key elements are in place: namely, a hero, a potential villain, a potential love interest, and an incriminating object in an enclosed space (see Frame 2.7). The following sequence is one minute in duration and consists of nine shots; it is filmed according to the classical 180-degree 'axis of action' system, with the camera as an invisible and ideally placed witness. Although the sequence contains some dialogue (John saying grace), it can be regarded as an example of what Hitchcock described as 'pure cinema': that is, it relies on purely *visual* terms - in particular, a series of nine *eyeline-matches* - to tell the main story.

Frame 2.7: Mind-reading: *The 39 Steps* (1935)

The first shot of the sequence establishes the relative positions of the four key elements, allowing the viewer to form a cognitive map of the scenic space: John sits at the head of the table with Hannay to his left and Margaret to his right; the newspaper lies in the centre of the table. In the second shot, the camera cuts in to show a head-on view of John saying grace; crucially, his eyes are closed. At this point, the sequence cuts to a shot of Hannay in three-quarters profile, the closer framing allowing us to distinguish the movements of his eyes (shot 3). Hannay looks to his left, in the direction of John (ELM 1), then downwards to his right, in the direction of the newspaper, eyes scanning left to right (ELM 2). How do we, the viewer, comprehend this particular shot? According to Baron-Cohen's account of the mind-reading system, the Eye-Direction Detector (EDD) will be capable of detecting the direction of the two eyelines in question and 'match' them to the relevant objects, thereby producing dyadic representations of the form "Hannay sees John" and "Hannay sees the newspaper". EDD will also take Hannay's sustained gaze at the newspaper as a sign of interest.) (As both John and the newspaper are situated off-screen, EDD must have access to our cognitive map of the scenic space.) Meanwhile, the Theory-of-Mind Mechanism (ToMM) will consider the dyadic representations from the EDD in conjunction with information from memory relating to narrative scenario 1 (man-on-the-run) in order to produce corresponding mental representations along the lines of "Hannay is checking that John is not watching him" and "Hannay wants to know what the newspaper says about him". (How much do the police know about him and his whereabouts? Will the newspaper incriminate him?)

Eyeline-match 1

EDD: Dyadic representation: Hannay-**sees**-John

ToMM: Mental representation: Hannay-**checks**-that John is not watching him

Eyeline-match 2

EDD: Dyadic representation: Hannay-**sees**-newspaper

ToMM: Mental representation: Hannay-**wants**-to know what newspaper says about him

While Hannay is busy reading the newspaper, the sequence cuts to a reverse shot of Margaret, also in three-quarters profile (shot 4). To begin with, Margaret looks upwards in the direction of Hannay, with an expression of apparent affection (ELM 3). According to Baron-Cohen's account, EDD will conclude that Margaret is looking at Hannay, whilst ToMM will consider this conclusion in conjunction with narrative scenario 2 (lonely wife-jealous husband), thereby inferring that the gaze is motivated by romantic interest. Subsequently, Margaret looks downwards to her left in the direction of the newspaper (ELM 4). Here, the situation becomes even more complex. In addition to EDD processing a dyadic representation of the form "Margaret sees newspaper", the Shared Attention Mechanism (SAM) will process a triadic representation of the form "Margaret observes that Hannay is looking at the newspaper". ToMM will consider both the dyadic representation from the EDD and the triadic representation from SAM, in order to produce a mental representation along the lines of "Margaret wants to know why Hannay is looking at the newpaper". (Notice that this particular inference will depend on general folk psychology - people tend to be curious about the objects of other people's attention - rather than specific narrative information relating to either scenarios 1 or 2.)

Eyeline-match 3

EDD: Dyadic representation: Margaret-**sees**-Hannay

ToMM: Mental representation: Margaret-**desires**-Hannay

Eyeline-match 4

EDD: Dyadic representation: Margaret-**sees**-newspaper

SAM: Triadic representation: Margaret-**sees**-(Hannay-**sees**-newspaper)

ToMM: Mental representation: Margaret-**wants**-to know why Hannay is looking at newpaper

The middle shot of the sequence (shot 5) presents a semi-subjective view of the newspaper from the point-of-view of Margaret. In turn, we see Margaret's reaction (shot 6) as she looks back upwards in the direction of Hannay with an expression of horror and confusion (ELM 5). The latter exchange gives rise to the second example of a triadic representation to be processed by SAM: i.e., Margaret and Hannay are now looking *at each other*. At this point, the mind-reading system switches back to narrative scenario 1 - especially our knowledge of the newspaper's contents - to infer that Margaret suspects Hannay of the Portland Place murder described on the front page.

Eyeline-match 5

EDD: Dyadic representation: Margaret-**sees**-Hannay
SAM: Triadic representation: Margaret-**sees**-(Hannay-**sees**-Margaret)
ToMM: Mental representation: Margaret-**suspects**-Hannay of murder

The sequence cuts to a reverse reaction shot of Hannay (shot 6). Hannay looks in the direction of John (ELM 6), in order to check that John still has his eyes closed, and then back to Margaret (ELM 7), at which point his eyes, as Truffaut says, 'voice an eloquent appeal' (ibid.). (The latter exchange gives rise to the third and final example of a triadic representation.) Here, Donat's performance is notably restrained - there is no need for the exaggerated kinesic expressions typical of the silent films made just a few years earlier - demonstrating the importance of narrative context.

Eyeline-match 6

EDD: Dyadic representation: Hannay-**sees**-John
ToMM: Mental representation: Hannay-**checks**-that John is not watching him

Eyeline-match 7

EDD: Dyadic representation: Hannay-**sees**-Margaret
SAM: Triadic representation: Hannay-sees-(Margaret-sees-Hannay)
ToMM: Mental representation: Hannay-pleas-his innocence to Margaret

At this stage, the sequence returns to the head-on view of John who, unbeknownst to Hannay and Margaret, has now opened his eyes (shot 8). John looks to his left in the direction of Margaret (ELM 8) and then to his right in the direction of Hannay (ELM 9). The mind-reading system switches back to narrative scenario 2 for a final time, thereby inferring that John suspects Hannay and Margaret of, in Truffaut's words, a 'romantic understanding' (ibid.).

Eyeline-match 8

EDD: Dyadic representation: John-**sees**-Margaret
ToMM: Mental representation: John-**suspects**-Margaret of desiring Hannay

Eyeline-match 9

EDD: Dyadic representation: John-**sees**-Hannay
ToMM: Mental representation: John-**suspects**-Hannay of desiring Margaret

The sequence concludes with a re-establishing shot (shot 9). The three characters now fill the frame, emphasising the claustrophobic tension of the scene. Hannay and Margaret realise that John has finished saying grace and look downwards uncomfortably. John makes an excuse and exits the cottage in order to spy on the two from the outside window.[30]

In conclusion, our capacity to read the minds of the three characters provides us with an example of *regarding-as (type II)*. Why is the notion of 'regarding-as' relevant? Although the sequence requires us to arrive at a series of 'complex theoretical diagnoses', we arrive at these diagnoses 'swiftly and effortlessly', seeing each of the character's (changing) mental states in a direct and intuitive fashion. When we are presented with, say, a shot of Richard Hannay, not only is our perception of "A man of such-and-such a description." forced from us, but our tendency to attribute Hannay with beliefs, desires, intentions, emotions, and the like, is largely beyond our conscious control. What about the 'type II' qualification? Whereas regarding Hannay's 'picture-face' as a face is the end-result of a Fodorian module (read: perceptual, local, psychophysically detectable), regarding Hannay's 'picture-face' as the face of an intentional agent is the end-result of what has been described as a Darwinian module (read: central, distributed, possibly 'forever invisible' to the neuroscientist). In particular, ToMM is *not* informationally

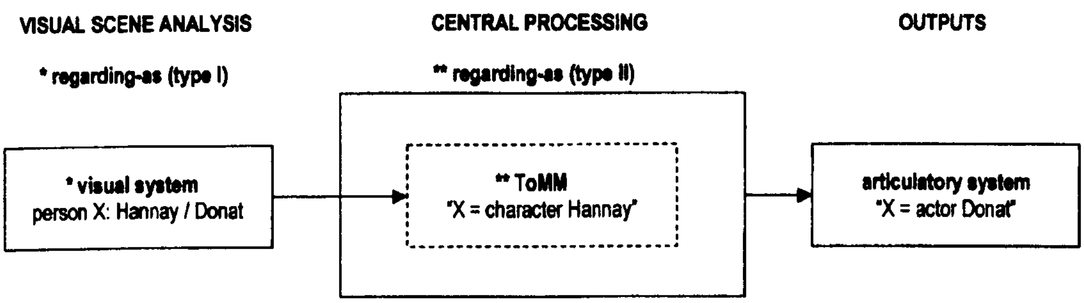
[30] For a discussion of how the space is constructed in this subsequent sequence, see Edward Branigan (1994), pp.56-62.

encapsulated in the Fodorian sense described above; for instance, it is extremely sensitive to relatively complex narrative information (namely, scenarios 1 and 2). Similarly, ToMM is cognitively penetrable in the sense that this information is freely available to consciousness, and if we have not been concentrating on the film's earlier scenes - or we are shown the sequence in isolation from the rest of the narrative - then the mechanism might arrive at erroneous diagnoses.

The argument can be developed in the following terms. To the extent that a person is defined by their intentional mental states, it is more 'natural' for us to regard a 'virtual person' as the corresponding character than as the actor who embodies that character: for instance, we are more likely to attribute the person 'Hannay / Donat' with the mental states of a man on the run in the Scottish Highlands than with the mental states of a man performing for the camera in a studio at Shepherd's Bush in London. (If we think of 'Hannay' and 'Donat' as being two 'aspects' of the same person, then the former has greater salience than the latter. I somehow doubt that we can 'flip' between the two with equal ease; in this respect, any analogy with the Jastrow duck-rabbit or the Rubin face-vase breaks down.) Why is this so? Crucially, there does not seem to be an inhibitory mechanism which 'switches off' ToMM when we encounter virtual people; indeed, psychologists take this fact for granted as they tend to test this capacity precisely by using representations. There are at least two possible reasons for the lack of such a mechanism. First, film characters are what Barkow (1992) describes as 'evolutionarily unanticipated' phenomena. At no time in our evolutionary history, therefore, has there existed an appropriate selection pressure. Second, mind-reading, as an essentially cognitive process, is not particularly draining on our resources and is usually private. Contrast reading the mind of a film character with responding in a full-blown emotional fashion to a scene from a film, either by running away from the proverbial monster or by attempting to save the character in danger: both activities would be expensive in a physiological and a behavioural sense (not to mention embarrassing in a social one).

Of course, if we are asked "In a strict sense, are you watching Hannay the character or Donat the actor?", we would reply "I am watching Donat the actor." This disparity, however, may reflect the contributions of different systems or levels of processing: self-report is mediated by the articulatory (vocal) system which is within our conscious control; and may be more intimately connected to the central processing which makes the correct distinction (see Figure 2.19). Similarly, we will refrain from physically coming to Hannay/Donat's aid at various stages of the film: behaviour is mediated by the somatic nervous system. Indeed, the latter scenario suggests that although an inhibitory mechanism may not exist for ToMM, a safety-valve of sorts is already in place; albeit, a valve which evolved for different reasons. It does not matter if we perceive and cognize the characters and events on the screen as if they were real as long as both our *emotion* and *action systems* are appropriately inhibited and/or disengaged. To put it another way, inaccurate (or 'non-veridical') perceptions and cognitions are tolerable as long as they occur within the confines of a mind, brain, and body which, overall, are wise to the bigger picture.

Figure 2.19: The relationship between mind-reading and articulation



N.B. The dashed line illustrates the 'cognitive penetrability' of the Theory-of-Mind Mechanism (ToMM).

(ii) Taking the emotional stance

Taking the emotional stance to an object or event in our environment can be understood in terms of the 'direct perception' of what Gibson describes as 'affordances'. To recap, the affordance of an object or event is what it 'offers' the observer (either for good or ill). Whereas a more realistic version of either Jastrow's duck or rabbit might 'afford' eating for the observer's 'good', a realistic version of a rattlesnake may 'afford' poisoning for the observer's 'ill'.

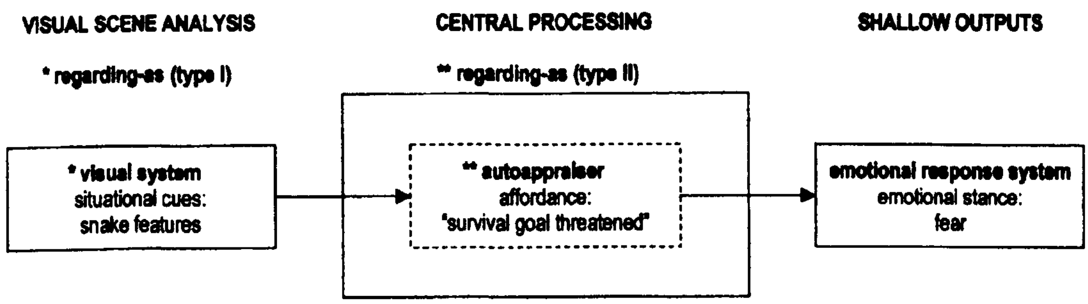
For a cinematic example, consider a scene from Steven Spielberg's *Raiders of the Lost Ark* (1981) (see Frame 2.8). In search of the Lost Ark of the film's title, the archaeologist Indiana Jones (Harrison Ford) climbs down a rope into the Well of Souls, a deep pit whose floor is crawling with dangerous snakes. Falling the last few feet, Jones lands in front of a venomous rattlesnake which rises up in readiness for attack. (Jones glances off-screen; the image of the snake is presented as a POV shot and accompanied by the sound of hissing and a musical stinger.)

Frame 2.8: Automatic appraisal: *Raiders of the Lost Ark* (1981)

Although Gibson refuses to make reference to inferential processes and mental representations, an explanation couched in computational terms suggests that the direct perception of affordances is another instance of *regarding-as (type II)*. To set the scene, the evolutionary psychologist's proposal that humans possess multiple faculties whilst facing multiple demands may lead to the following objection: What prevents incompatible faculties from being activated simultaneously? This is where emotions come into play. Cosmides and Tooby (2000) describe emotions as *superordinate programs* which - to adopt the simple trichotomy of inputs, processing, and outputs - co-ordinate the 'subprograms' running within perceptual systems, cognitive-motivational systems, and physiological and behavioural systems respectively. The authors suggest that each emotion corresponds to a certain type of situation / 'adaptive problem' encountered by our hunter-gatherer ancestors in the Pleistocene: for instance, the situation of being confronted by a rattlesnake entails the adaptive problem of self-preservation.

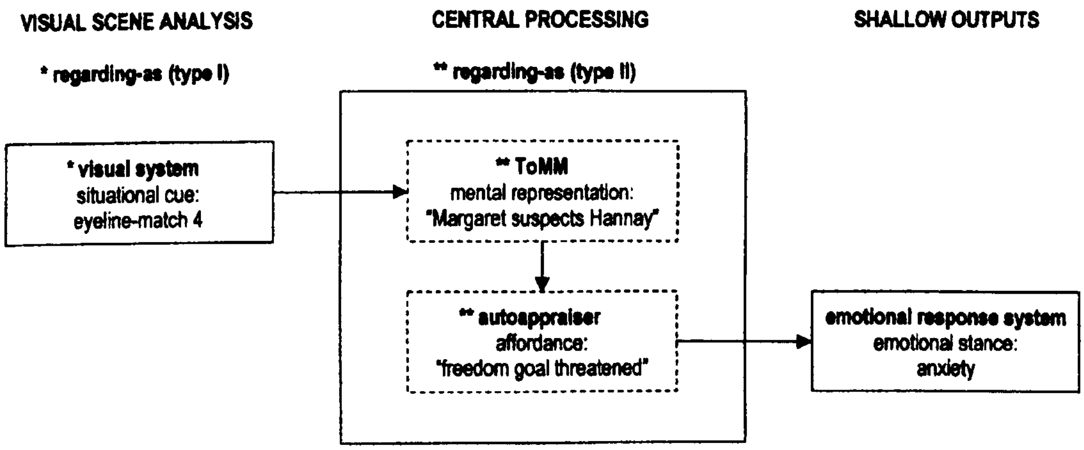
Both the real-world and filmic situations present specific cues; namely, 'snake features'. (Indeed, the human visual system may contain 'snake detectors' in the way that a frog's visual system may contain 'bug detectors'.) Cosmides and Tooby propose that there are *monitoring algorithms* (or 'demons') which are closely related to the perceptual systems and receive situational cues as input; *situation-detecting algorithms*, on the other hand, consider the outputs of monitoring algorithms along with the contents of memory and so forth. Significantly, the authors note that the employment of a situation-detecting algorithm is approximately equivalent to the process of *cognitive appraisal*. (In this respect, they cite Lazarus and Lazarus (1994).) In a related fashion, perhaps we should think of the appraisal of emotional significance as being performed by an array of what Paul Ekman (2003, p.21) describes as 'automatic-appraising mechanisms', or *autoappraisers* for short (see Figure 2.20). Autoappraisers exhibit some of the properties of Darwinian modules; with respect to film viewing, for example, they are relatively 'sensitive' to the personal and environmental variables cited by Lazarus on the one hand, but relatively 'insensitive' to those variables (beliefs, concepts, and memories) which pertain to the true nature of the viewer's environment on the other. In addition, autoappraisers are not detectable psychophysically. (Both the *Raiders* snake example and the notion of 'cognitive appraisal' will be discussed further in subsequent chapters.)

Figure 2.20: Automatic appraisal (I)



Having considered the prototypical example of being confronted by a snake, it should be noted that autoappraisers may be capable of dealing with emotional situations of considerably greater subtlety and complexity. To go to the opposite extreme, then, let us return briefly to the sequence from *The 39 Steps*. Given that we have been aligned with Hannay, it is plausible that 'goal structures' which correspond to his situation will be activated. (The issues of 'alignment' and 'goals' will be discussed in greater detail in Chapters 4 and 5.) Following the fourth eyeline-match, one could argue that the mental representation "Margaret suspects Hannay of murder" has emotional implications with respect to Hannay's freedom; to use Gibsonian language, the glance and corresponding facial expression 'afford' the possibility that Hannay's 'freedom goal' will be threatened (a possible instance of empathy). Similarly, following the eighth eyeline-match, the mental representation "John suspects Margaret of desiring Hannay" also has emotional implications, albeit for a different set of reasons (a possible instance of sympathy). It is plausible, therefore, that the corresponding autoappraisers will be sensitive to the outputs of ToMM.

Figure 2.21: Automatic appraisal (II)



2.4 NON-MODULAR CENTRAL SYSTEMS: PRODUCERS OF 'DEEP OUTPUTS'

(a) Discriminating the world: central processing

So far, we have discussed our perceptual and cognitive relationship to both the world and the cinema: for instance, we have looked at how we directly perceive both a human face and a picture-face, and how we directly cognize the minds 'behind' such faces. If we were concerned with the world alone, then it is feasible that we could stay with the type of perceptual and cognitive capacity described. Given, however, that we are concerned with both the world and the cinema - and especially the latter - we must address the esoteric question of how we *discriminate* the one from the other.

This question requires us to take seriously Fodor's arguments for the *non*-modularity of central processing. Although these arguments date back to at least 1983 and the confusingly entitled *The Modularity of Mind*, the discussion can be framed in terms of a more recent debate. If taken to its logical extreme, the 'New Synthesis' of computational psychology and evolutionary theory - advanced by Cosmides and Tooby, and endorsed by both Pinker (1997) and Plotkin (1997) - leads to a sharply contrasting position: according to the *Massive Modularity Hypothesis* (MMH), the mind is largely, or even entirely, modular in nature. In a 2000 book entitled *The Mind Doesn't Work That Way*, Fodor challenges the New Synthesis / MMH by presenting two main arguments; these arguments can be described under the rubric of the *input problem* and the *frame problem*.

(i) The input problem

The input problem concerns the question of how perceptual information is filtered from the periphery of the mind to the central workspace. In order to illustrate the input problem, Fodor discusses Cosmides and Tooby's (1992) notion of the cheater detection module (CDM) - introduced in section 2.3.

(1) Argument. The gist of Fodor's argument can be summarised as follows. Imagine being confronted by a social situation in which an acquaintance is attempting to accept a benefit from you without satisfying the relevant requirement: some information presented by the situation would be of relevance to cheater detection, whilst other information would not be. The inputs to the visual system would be selected by transducers at the retina. Considering, however, that the CDM operates 'outside' the perceptual systems, the notion of a 'CDM transducer' is implausible. How, then, are the inputs to the CDM selected? By definition, the computational mechanisms which select the one from the other must be less domain specific (and so on) than the CDM itself. Therefore, the mind cannot be 'massively modular'.

(2) Counter-argument. How convincing is this argument? First, it should be acknowledged that it is not clear that any evolutionary psychologist actually subscribes to MMH. Although Cosmides and Tooby (2000, p.56) describe the mind as 'a network of special-purpose computational mechanisms', they also concede that some general-purpose mechanisms must be 'embedded' in this network. Second, Cosmides (personal communication) argues that Dan Sperber (1996) effectively offers a solution to the input problem. In short, Sperber proposes that the mind is composed of 'three tiers' of modules: namely, *perceptual modules* (consistent with Fodor's account); first-order *conceptual modules*; and second-order *metarepresentational modules*. Significantly, Sperber suggests that the output of a perceptual module is capable of satisfying the *input conditions* of a conceptual module, whose output, in turn, is capable of satisfying the input conditions of a metarepresentational module, and so on.

In spite of these two objections, a consideration of the input problem is of relevance to understanding the impact of the shallow outputs described previously. It is plausible, for instance, that the basic categorizations "moving object" and "moving eyes" are capable of satisfying the input conditions of the Intentionality Detector (ID) and the Eye-Direction Detector (EDD) respectively, whose outputs, in turn, are capable of satisfying the input conditions of the Theory-of-Mind Mechanism (ToMM); hence, our inclination to attribute the characters in *The 39 Steps* with intentional mental states which, in a strict sense, do not exist. Similarly, the basic categorization "snake" may be capable of activating both monitoring and situation-detecting algorithms (otherwise known as autoappraisers), which, in turn, may lead to the activation of the 'appropriate' emotion program.

(ii) The frame problem

According to Fodor (1983), the results of perceptual processing are sent to (non-modular) central systems for cognitive processing. Starting from an evolutionary-ecological perspective, the domain of the central systems is solving the adaptive problem of the *fixation of perceptual belief* (although the default mode of the central systems is still likely to be naïve realism). In order to solve this problem, the central systems must effectively answer the following key question: *What is the true nature of the immediate environment?* Once again, the non-modularity of the central systems can be addressed from two basic perspectives (see Table 2.8).

(1) A functional perspective. If the essence of modularity lies in the property of informational encapsulation, then the essence of *non*-modularity lies in the property of *global sensitivity*. The 'global sensitivity requirement' is best illustrated by considering what artificial intelligence researchers call the *frame problem*: viz., how can one place a 'frame' around the body of information which might be of relevance to arriving at a 'best explanation' about one's environment, or the body of information which, even if it is not directly relevant, may have an indirect influence on the explanation in question? In light of the frame problem, central systems may need to access information held by any other 'system' at any given time: for instance, they may need to 'look' at the conclusions of the perceptual systems along with the contents of memory. In relation to the New Synthesis, Fodor (2000, p.28) proposes that many cognitive processes appear to be 'globally sensitive' or *abductive* in nature. He argues, however, that the only types of computations

we currently understand are the *Classical computations* proposed by Alan Turing, which, to recap, are defined as 'formal operations on syntactically structured mental representations' (p.11). Unfortunately, these computations are 'intrinsically local and thus badly equipped to account for the abductive aspects of cognition' (p.79). (Fodor also rejects the connectionist way of explaining abduction - the role of connectionism will be discussed in Chapters 4 and 5.)

Even if 'abductive' cognition is beyond the scope of our understanding, how should we think of the operations and end-products of the central systems? Although in a strict sense the operations of the central systems are neither 'mandatory' nor 'fast', Fodor (1983, p.104) assumes that central processing proceeds in a 'largely nonconscious' fashion; that is, usually we do not have to consciously consider the type of question cited above. It is up to us to coin a suitable term to describe the nature of the end-products. For Fodor, central processing is effectively the end of the line. Given, however, that we are ultimately concerned with the relationship between the central systems and the emotion system - and given that the perceptual systems produce 'shallow outputs' in the form of 'basic categorizations' - let us assume that the central systems produce *deep outputs* in the form of *abstract categorizations* (to be described in greater detail below).

(2) A neurobiological perspective. Given that central systems may need to access information held by any other 'system' at any given time, it is plausible that they are associated with *equipotential*, as opposed to 'fixed', neural architecture. As a possible candidate, Fodor (ibid., p.118) cites the so-called 'association cortex', the part of the neocortex which is neither sensory nor motor (and which includes the prefrontal cortex). (Contrast this particular scenario with the case of the visual system, where a circumscribed number of modules - or 'areas' - are linked to each other by what could be described as 'hardwired' neural connections.) In addition, the lack of a clear correlation between 'neuroanatomical form' and 'psychological function' explains why there are no specific 'breakdown syndromes' for central processes - cf. the cases of object and face-blindness cited previously - and why there is no 'neuropsychology of thought'. As we will see, the fact that central processing is *distributed* in a neuroanatomical sense has significant implications when it comes to understanding its relationship to the emotion system.

(3) Objections. Inspired by the ideas of Cosmides and Tooby, Sperber (1996) attempts to challenge Fodor's notion of *non*-modular central systems by taking an explicitly evolutionary approach. First, Sperber notes that Fodor ignores 'evolutionary considerations', only making one argument which could be regarded as evolutionary:

namely, the proposal that perceptual systems are phylogenetically older than central ones. (p.43) Second, Sperber tells an evolutionary 'just so' story about a species of imaginary organisms called *protorgs* and a small group of their descendents called *orgs* (p.125). Protorgs were in constant danger of being crushed by approaching elephants, an event which always presented a conjunction of two cues; namely, 'noises N' and 'soil vibrations V'. Accordingly, protorgs were equipped with an 'acoustic perception module' and a 'vibration perception module', both of which were directly connected to an output (flight) module. The fact that the flight response could be elicited by *either* N *or* V, however, resulted in many 'false positives' and wasted resources. In the case of the orgs, on the other hand, evolution inserted a *conceptual module* between the perceptual modules and the output module; this module effectively operated as an 'AND-gate', thereby allowing for more accurate responses to the environment. As a result, the orgs were able to compete more effectively for limited resources and eventually succeeded the protorgs. Sperber concludes that evolution by natural selection, as a slow and blind process, is more likely to result in the 'emergence' of new modules - for example, conceptual modules of the type described - as opposed to 'demodularization'; hence, Fodor's notion of *non*-modular central systems is untenable.

Although Sperber's 'just so' story paints a plausible picture of the mind and its evolutionary origins, for our purposes the essence and value of Fodor's account remains the same. First, Fodor (1983) makes numerous ecological arguments for the modularity of perceptual systems - for example, the quote "If you're called by a panther/don't anther" (p.70) - which, with their appeal to survival advantage, are but one short step from an evolutionary account. Second, many of Sperber's objections to Fodor's arguments for the *non*-modularity of central processing hinge on what one understands by the terms 'module' and 'informational encapsulation'. If one chooses to classify an individual concept as a 'micro-module', then so be it. The important point is that, unlike, say, the modules which comprise our visual system, one concept has a relatively large number of connections to other concepts; informational encapsulation - and hence, modularisation - is *a question of degree*. What is more, Sperber crucially admits that his own 'three-tier' model of the mind is at 'risk of computational explosion'; a way of saying that it is susceptible to the frame problem described by Fodor.[31]

[31] In order to address this issue, Sperber tentatively proposes the existence of an 'attentional buffer' which temporarily holds the most relevant information for processing at any given time. In an earlier work, Sperber and Wilson (1986) use relevance theory in an attempt to improve our understanding of central processing in

In conclusion, we should propose to steer a 'middle course' between the various positions described so far. First, our perceptual systems are modular in the way that Fodor describes: for instance, they are informationally encapsulated and produce shallow outputs. Second, the central workspace of the mind consists of the domain-specific mechanisms postulated by evolutionary psychologists in conjunction with more general-purpose mechanisms: therefore, the input problem may not be a problem after all, whilst its solution may provide us with a way of understanding the impact of the shallow outputs described. Third and final, at least some cognitive processes are globally sensitive or abductive in nature: as far as I can tell, the frame problem really *is* a problem; however, we need to obtain at least some idea of how central processing relates to the emotion system.

Table 2.8: Central processing (see Fodor, 1983, 2000)

	property	**description**
(1) functional	questions * (domain)	general: i.e., fixation of perceptual belief
	computational character / default mode	globally sensitivity (abduction) / naïve realism
	answers (outputs)	deep: e.g., abstract categorization
(2) neurobiological	neural architecture	equipotential: distributed

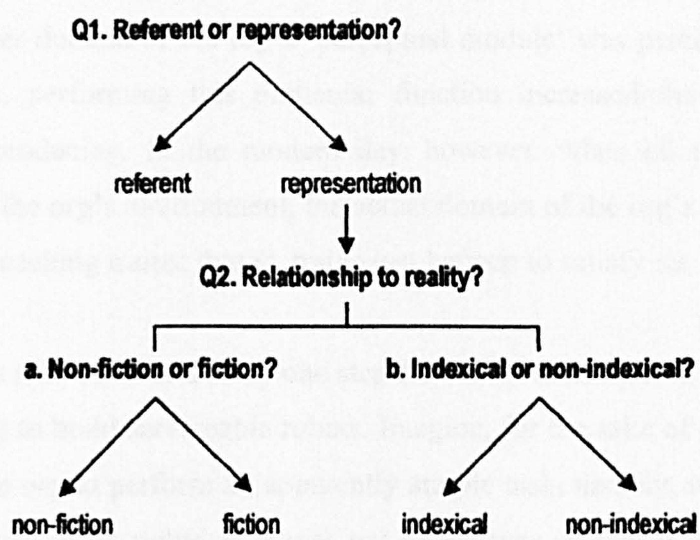
* The evolutionary-ecological approach can be regarded as a complementary perspective.

general and communication in particular, where the relevance of information is a function of cognitive effect (benefit) and processing effort (cost).

(b) Discriminating the cinema: seeing-as (type I)

How should we understand our 'discriminatory' relationship to the cinema? Say that we are presented with a cinematic representation of either a person, object, or event (call it X). Given that the default mode of our perceptual systems is naïve realism, the central systems must effectively answer a hierarchy of key questions which can be arranged in a decision tree format (see Figure 2.22): first, *Is our perception of X based on the referent of X or a representation of X?*; and second (given that the latter is the case), *How does the representation of X relate to reality? Is it: (a) fictional or non-fictional; and (b) indexical or non-indexical?*

Figure 2.22: Central processing: decision tree of questions



(i) Question 1: Referent or representation?

The 'referent or representation' question brings us back to the paradox of representation (discussed in section 2.2). So far, we have argued that the notion of a sensory illusion is not appropriate. How, though, should we understand the central process which ascertains that we are *not* in the actual 'presence' of Karen and her family in *The Idiots* and that we *not* actually 'immersed' in either the hillside environment of *The Thin Red Line* or the airfield environment of *Heat*? Similarly, how should we understand the central process which ascertains that Richard Hannay of *The 39 Steps* is *not* an actual 'intentional agent' and that the snake which confronts Indiana Jones in *Raiders of the Lost Ark* is *not* of actual 'emotional significance' to our own goals and concerns as viewers?

All of these questions can be addressed by conjuring up a new example. To set the scene, two preliminary remarks will be necessary. First, Fodor (2000, p.37) states: 'It's a striking peculiarity of Pinker's book in particular that he starts by remarking how hopelessly far we are from being able to build a serviceable robot, but never explains how to reconcile our inability to do so with his thesis that we know, more or less, how the cognitive mind works.' (Fodor also notes that neither Pinker nor Plotkin mention the frame problem in the indexes of their books (p.42).) Second, Sperber proposes that the *proper domain* of a module is 'all the information that it is the module's biological function to process', whilst the *actual domain* of a module is 'all the information in the organism's environment that may ... satisfy the module's input conditions' (pp.136-138). In order to illustrate this distinction, Sperber tells another story about orgs. In the beginning, for instance, the proper domain of the org's 'perceptual module' was perceiving approaching elephants; that is, performing this particular function increased the org's chances of surviving and reproducing. In the modern day, however, when all the elephants have disappeared from the org's environment, the actual domain of the org's perceptual module is perceiving approaching trains; that is, trains just happen to satisfy the input conditions in question.

Now let us take Sperber's story one step further by relating it to Fodor's comments about our inability to build serviceable robots. Imagine, for the sake of argument, that you construct a *robotic org* to perform an apparently simple task: namely, whenever it catches an approaching train in its sights, it moves out of the way so that it doesn't get crushed under the train's wheels. (In this case, perhaps, we can legitimately say that the proper domain of the org's 'perceptual module' is approaching trains, although this domain has been set by the real designs of a purposeful engineer as opposed to the apparent designs of what Richard Dawkins, 1986, might describe as 'the blind robot-maker'.) In order to test your new creation, you take the org down to your local railway line, placing it in between the two rails. Sure enough, as soon as an approaching train is visible in the distance the org moves safely out of the way.

You are pleased with your engineering efforts but a potential problem is nagging at the back of your mind. The following day, you decide to take the org to your local cinema where, as fortune would have it, the cinema owner - a fan of early cinema - is showing a programme of short films by the Lumière brothers (dating 1895). After a showing of

Workers Leaving the Lumière Factory, *Feeding the Baby*, and *Watering the Garden* - which, not surprisingly perhaps, leaves the org somewhat cold - the *Arrival of a Train at the Station* flashes up on the screen and, as you feared, the org makes swiftly for the exit (see Frame 2.9). Why? Presumably, the information provided by the film's 'optic array' satisfies the 'input conditions' of the org's perceptual module. How, then, could you program the org to discriminate the film of the train from an actual train? How could you place a 'frame' around the body of information which might be of relevance to making the appropriate discrimination?[32] What 'assumptions' about the world - and the ritual of film viewing - would you have to build into its proprietary database?

Ultimately, of course, we are concerned with the *human* viewers of such a film. According to popular myth, the viewers of 1895 confused the image of an approaching train for an actual train and responded in a similar fashion to the org in our imaginary story. Tom Gunning (1994, p.118) argues, however, that the Lumière films were 'initially presented as frozen unmoving images, projections of still photographs. Then, flaunting a mastery of visual showmanship, the projector began cranking and the image moved.' As a result, the audience's screams were not motivated by fear; rather, they were motivated by astonishment at a technological achievement - namely, the invention of the moving image. (Gunning also cites the role of advertising and commentary.) To use Loomis's terms, there was sensory - but not epistemic - equivalence between the Lumière film and an actual train. A better, and more contemporary, example is Loomis's anecdote (personal communication) about a show at the Luxor Hotel in Las Vegas. The audience believed they were watching the filming of a live television show, with live actors, studio set, cameras, and so forth. In actual fact, they were watching a *film* of a filming of a live television show; the film was presented in such a way that the edges and flatness of the projected image were imperceptible. After ten or so minutes, the actors began to vanish into thin air, to the astonishment of the audience. In this case, then, there was both sensory and epistemic equivalence.

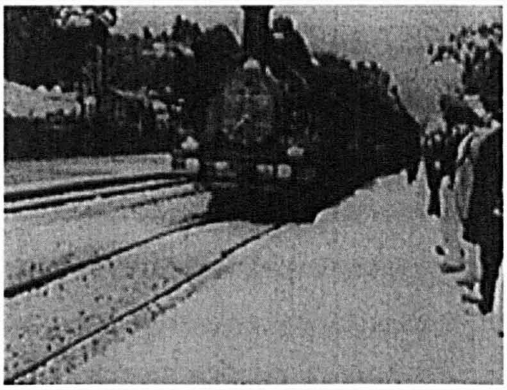
Considering Gunning's revision, perhaps we should appeal to the third, as opposed to the first, 'tier' of Sperber's model of the mind; namely, second-order *metarepresentational modules.*[33] In short, Sperber suggests that the proper domain of the

[32] Of course, the capacity to perceive an approaching train might be subject to the frame problem as well.

[33] Cosmides (personal communication) suggests that another potential candidate is Gazzaniga's theory of the left-brain interpreter - to be discussed in Chapter 3.

metarepresentational module may be folk psychology; in other words, it may be equivalent to the Theory-of-Mind Mechanism (ToMM) described above. He suggests, however, that the module may have been 'exapted' for various (cultural) purposes. The Lumière brothers' film is an example of a public representation, and presumably the 1895 viewer's understanding of its non-veridical status entailed a mental representation *about* a public representation. From 1895, then, perhaps one of the *cultural domains* of the metarepresentational module became discriminating films of trains from actual trains. One could argue, however, that describing the capacity in question as 'modular' only 'frames' it in a convenient linguistic sense; it is still not clear which information was of relevance to the process in question.

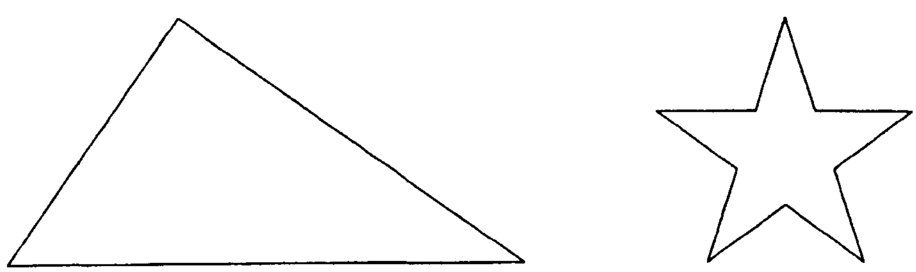
Frame 2.9: Central processing: *Arrival of a Train at the Station* (1895)



Considering the apparent intractability of the frame problem, let us attempt to reach a reasonable compromise by turning to the notion of *seeing-as*. To set the scene, Wittgenstein (1958, p.200) proposes that we are capable of <u>seeing</u> a schematic triangle <u>as</u> 'hanging from its apex', rather than, say, 'standing on its base' (see Figure 2.23, left). According to Turvey (1997, p.451), this type of example is significant because it serves to illustrate that when visual perception involves mental interpretation, the aspects in question 'originate outside the figure, in the context of the beholder's imagination'. (The example of the schematic triangle is also cited by Allen, 1997, pp.86-87, in his discussion of the imagination theory.)

The type of seeing-as that we will be concerned with, however, will be referred to *seeing-as (type I)* - the bracketed qualification will serve to distinguish it from yet another type of seeing-as to be discussed below in section 2.5. In a criticism of Gibson's theory of direct perception, Fodor and Pylyshyn (1981, p.189) cite the example of a man at sea who is capable of *seeing* a dot of light in the night-time sky *as* the Pole Star, as opposed to, say, another type of star or a firefly (see Figure 2.23, right). Although this psychological capacity must make reference to an 'aspect' which, in some sense, 'originates outside the figure', it differs from the capacity described by Wittgenstein in two significant respects. First, the aspect in question does not originate in the context of the man's imagination as such; rather, it originates in the context of his *epistemic mental states*. In this particular case, we can divide the man's epistemic mental states into at least three categories: namely, his *beliefs*, *knowledge*, and *memories* regarding the composition of the night-time sky. Second, the capacity does not necessarily involve an element of mental (i.e., consciously controlled) interpretation: presumably, once the man has successfully identified the star, he does not have to keep reminding himself of its identity (in the way that he would have to keep imagining the schematic triangle as, say, 'hanging from its apex').

Figure 2.23: Suspended triangle (left) and Pole Star (right)



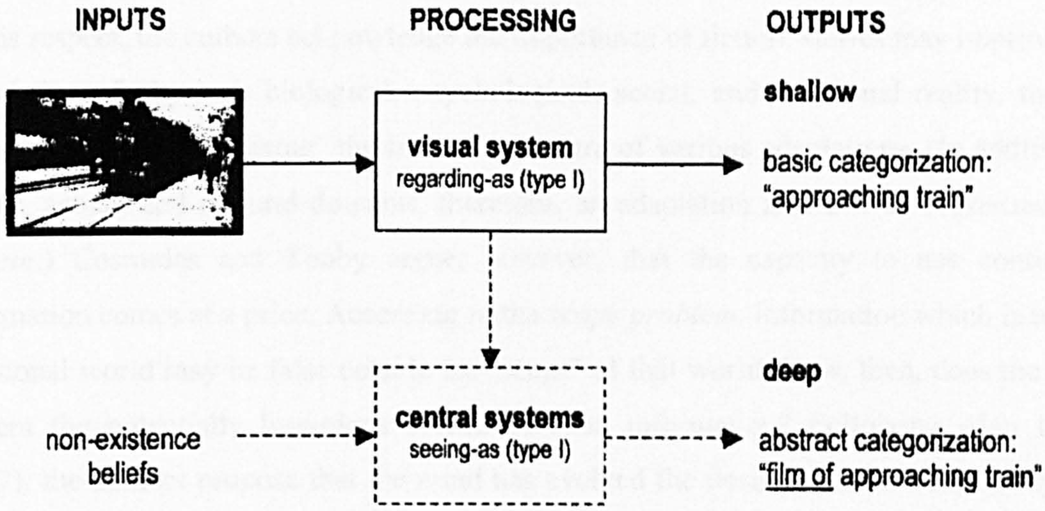
If the psychological capacity to discriminate a cinematic representation from its actual referent involves seeing-as (type I), then which epistemic mental states might be of relevance?[34] Let us consider each of the three categories cited above. *(1) Beliefs*. The main candidates here are what we have described as *non-existence beliefs*; that is, beliefs in the non-existence of the objects and events which are 'projected' onto the screen. Other candidates include a whole variety of beliefs relating to the ritual of film viewing in general, and the nature of the film being shown in particular. Notice, then, that the current account avoids the eliminative materialism mentioned in the first chapter. *(2) Knowledge*. With respect to the screen's edges, how is it that we perceive a finite image as opposed to a

[34] Currie (1995, p.85) discusses our capacity to discriminate paintings of horses from actual horses: in addition to acknowledging the importance of perception, he stresses the role of memory and 'the sorts of general principles I have developed over the years concerning what sorts of things are likely to be located in what sorts of places (art galleries are more likely to contain horse paintings than horses).'

'magic window' onto an infinite world? Even if the term 'screen' tends to conjure up a visual image, our conceptual understanding of what a screen is, what function it performs, and the like, is to a certain extent sensory independent, domain neutral, and therefore centrally mediated. It is also bound up with our conceptual understanding of what a projector is, what function that performs, and so forth. *(3) Memories*. With respect to the screen's flatness, it is plausible that 'cognizing' the screen as flat from an optimum viewing position at time t2 requires access to either the short-term or long-term memory of perceiving the screen as flat from a non-optimum viewing position at time t1. Such a memory would not be available to the visual system - which only has access to the outputs of transducers, a 'proprietary database', and a 'form-concept dictionary' - but would be available to central systems - which have unrestricted access to a variety of systems. (Furthermore, our memory *that* the screen is flat may be stored in 'propositional', as opposed to 'analogical', form.)

In conclusion, the overall story might go as follows (see Figure 2.24). The first half of the story concerns *regarding-as (type I)*: our visual system analyses the film's optic array and produces the basic categorization, "A train of such-and-such a description" as a shallow output. The second half concerns *seeing-as (type I)*: central systems receive the output in question, and after considering perceptual information pertaining to the nature of the viewing situation, along with the types of non-existence beliefs, knowledge, and memory cited above, they produce the more abstract (and accurate) categorization, "<u>Cinematic representation of</u> a train of such-and-such a description" as a deep output. In conclusion, a *global* epistemic illusion does not take place: although our visual system 'suggests' that there is a certain type of object in front of us, 'epistemically unbounded' central systems 'decide' - by a process of abductive inference - whether or not this is the 'best explanation' for what is actually taking place, thereby fixating our perceptual beliefs as to the true state of our environment.

Figure 2.24: Central processing: referent or representation?



(ii) Question 2: Relationship to reality:
fiction or non-fiction, indexicality or non-indexicality?

The distinction between representation and referent can be thought of in binary terms: viz., an object is either physically present or not. How, though, should we understand the relationship that a cinematic representation bears to reality, or what Torben Grodal (1997) would describe as the representation's 'reality-status'? This question will bring us back to the threshold model of diegetic influence - adapted from the research on immersive virtual environments (IVEs) and introduced in section 2.2. Notice that the subjects who explore IVEs 'know' that a virtual character is only a representation; the factor of agency concerns the relationship that this representation bears to an actual person outside the IVE.

□ *Question 2a: Fiction or non-fiction?*

The most obvious relationship between representation and reality lies in the distinction between *fiction* and *non-fiction.* To set the scene, let us consider an evolutionary-ecological perspective once again. Cosmides and Tooby (2000) observe that non-human species are only capable of responding to an aspect of the environment if they possess the corresponding circuit or program. Human beings, however, are capable of using 'contingent information' about 'local conditions' to guide their behaviour in appropriate ways - an adaptive mode described by Tooby and DeVore (1987) as the 'cognitive niche'. In this respect, the authors acknowledge the importance of fiction: stories may improve our knowledge of physical, biological, psychological, social, and emotional reality, thereby playing a role in 'organizing' the internal structure of various adaptations. (In addition to proper, actual, and cultural domains, therefore, an adaptation also has an *organizational domain.*) Cosmides and Tooby argue, however, that the capacity to use contingent information comes at a price. According to the *scope problem*, information which is true in a fictional world may be false outside the 'scope' of that world. How, then, does the mind prevent the potentially hazardous spread of false information? Following Alan Leslie (1987), the authors propose that the mind has evolved the design features of *scope syntax* and *decoupling systems*: a piece of fictional information will be labelled as a 'metarepresentation' and 'decoupled' accordingly.

In order to understand the relationship between fiction and non-fiction, we need to keep sight of the adaptive value of fiction, whilst taking on board some of the potential complications. To begin with, Cosmides and Tooby seem to subscribe to an 'empiricist theory' of fiction. Consider, once again, Colin Radford's (1975) thought experiment (introduced in the first chapter):

> Suppose that you have a drink with a man who proceeds to tell you a harrowing story about his sister and you are harrowed. After enjoying your reaction he tells you that he doesn't have a sister, that he has invented the story. In this case ... we might say that the 'heroine' of the account is fictitious. Nonetheless ... once you have been told this you can no longer feel harrowed. (p.68)

According to the empiricist theory, a statement along the lines of, "My sister is terminally ill," would assert that: (1) the sister exists; and (2) the predicate "is terminally ill" applies to the sister. If both the existential condition and the predication hold, then the statement is *true*; if either of the two fails to hold, then the statement is *false*. In this case, then, we have two values - 'true' and 'false' - corresponding to *existence beliefs* and *non-existence beliefs* respectively.

Our first task is to supplement the empiricist theory of fiction with what Carl Plantinga (1997) describes as an 'index/stance view'. According to Carroll's (1983) theory of 'indexing', a story is marked as either an instance of fiction or an instance of non-fiction: for instance, a storyteller may begin their story by saying either, "It is fictional that" or "It is true that" respectively. Following Nicholas Wolterstorff's (e.g., 1976) theory of 'projected worlds', the type of indexing in operation determines the nature of the stance we take to the fiction: in the way that a speaker is able to utter a sentence either fictively or assertively, a listener is able to take either a *fictive stance* or an *assertive stance* towards that sentence.[35] Given, however, that the default mode of the central systems is likely to be naïve realism - that is, 'truth' or assertion is implicitly assumed - we need to make a fundamental adjustment to Plantinga's account. This adjustment can be illustrated by returning to Radford's example. *Before* the revelation, we have no reason to suspect that the man is telling us anything but the truth. It is not a case, therefore, of us actively taking the assertive stance towards the man's story; rather, it is a case of us *not* taking the fictive stance. (Or to put it another way, it is not a case of us actively believing that the man's sister exists; rather, it is a case of us not *disbelieving* that the man's sister exists - double negative intended.) *After* the revelation, the man's story is explicitly indexed as an instance of fiction. In light of this, we override the default mode in question by actively taking the fictive stance. (Correspondingly, it is now legitimate for us to say that we actively belief that the man's sister does not exist.)

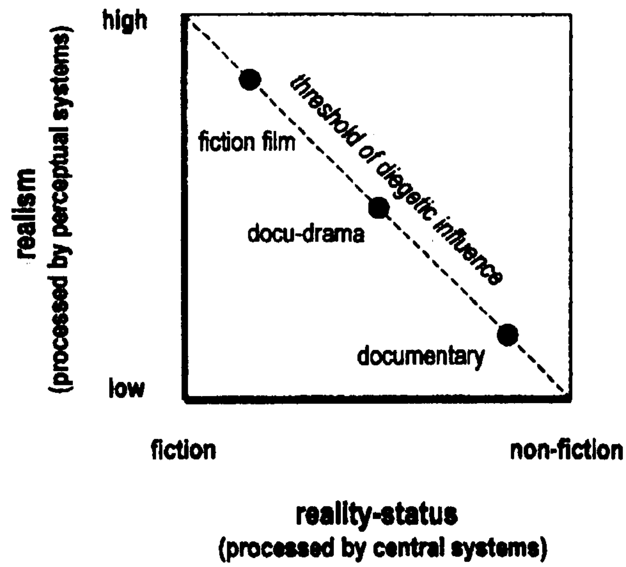
Our second task is to supplement the empiricist theory of fiction with what Edward Branigan (1994) describes as a 'psychologically real' theory. On the one hand, this move accounts for the possibility of 'mixed fictions'. Aspects of the man's story may be true: for instance, the hospital in which the sister is allegedly staying may genuinely exist and contain genuinely ill patients. On the other hand, it accounts for the possibility that fictions are related to reality in a variety of ways. In a discussion of how we 'sort the fruit from the chaff', Ellen Spolsky (2001) argues against Cosmides and Tooby's distinction between 'truth' (existence) and 'falsity' (non-existence), proposing that 'what counted on the Pleistocene savanna was not truth, but "fitness", or appropriateness in a context.' In light of this, the man's story could be assessed for such values as plausibility and self-relevance - corresponding to *plausibility beliefs*, *relevance beliefs*, and so forth.

How do these two considerations apply to film? Let us develop the threshold model of diegetic influence by placing 'fiction' at the low end of the reality-status continuum and 'non-fiction' at the high end (see Figure 2.25). With respect to the 'index/stance' element, external indexing is provided through the process of distribution and exhibition, whilst

[35] Also see Searle's (1969) speech act theory.

internal indexing is provided through such conventions as titles and credits. With respect to the 'psychologically real' element, the fact that reality-status is described as a 'continuum' will allow for certain complications.

Figure 2.25: The threshold model of diegetic influence: fictionality



N.B. For the sake of clarity, the line indicating diegetic presence has been omitted.

(1) Low reality-status. Starting at the 'low end' of the reality-status continuum introduces us to the category of films which are externally indexed as *fictional.* At first glance, science-fiction films seem to be straightforwardly fictional in the sense that they feature either non-existent or impossible worlds. Upon closer examination, however, the implausibilities of such films are, and must be, surprisingly superficial: if they were not rooted in physical, biological, psychological, social, and emotional reality - thereby allowing the viewer to adopt the respective stances to the objects and events depicted - then they would be both incomprehensible and unengaging. The fact, then, that George Lucas's *Star Wars* (1977) takes place 'a long time ago, in a galaxy far, far away' is largely irrelevant; indeed, Lucas's film famously combines elements from Western and Eastern folklore. In a related fashion, the viewer may be more concerned with finding 'coherent' relations between elements *within* the diegesis, rather than finding referential relations between the diegesis and the world (see BonJour, 1985, on 'coherence theories of truth').

What about more apparently plausible, or realistic, fiction films? Consider, for example, Ken Loach's dramas about working-class life in Britain. At first glance, the characters and events of *Kes* (1969) are straightforwardly fictional (see Frame 2.10). It is highly unlikely, for instance, that a teenage boy answering the exact physical description of Billy Caspar has ever raised a baby kestrel in the exact manner depicted. The fact that the character in question is embodied by an actual person (namely, the actor David Bradley), however, may have important implications for engagement (cf. the character in the original novel by Barry Hines). Much of the action, though staged, is actual: when Caspar / Bradley walks down the street, he is really doing so. And of course, the action takes place in actual, if non-identifiable, locations - in and around the Yorkshire town of Barnsley.

Beyond the physical, however, the relationship between the film and the world can be complicated further in at least three ways. The first way is through *assertion* (see Plantinga, 1997). Loach's film makes various 'assertions' about the state of the world, especially social and political issues - the potential unfairness of an education system which does not make allowances for a person's background, which only values academic subjects like English and mathematics as opposed to practical subjects like falconry, and so forth. The second way is through *partially determined reference* (see Branigan, 1994, Ch. 7). Although the character of Billy does not have a determinate referent within the world, one could argue that he has many partially determined referents: in other words, there are teenage boys in twenty-first century Britain and elsewhere who resemble him and who have found themselves in similar situations (broken homes, poor job prospects).[36] The third and final way is through *self-relevance*. The viewer may assess the relevance of the film's content to their own situation (with respect to their goals and concerns): for an affluent American viewer, the characters and events of *Kes* may have partial determination alone; for a working-class British viewer, however, they may have both partial determination and self-relevance.

(2) Medium reality-status. Moving to the 'middle' of the reality-status continuum leads us to the problematic category of films which are externally indexed as *docu-dramas*: that is, 'dramatic' films which attempt to 'document' *actual* figures and events. In recent years, notable examples have been made by Steven Spielberg and Oliver Stone, both of whom have been accused of rewriting the history books for the current generation.

[36] Radford (1975) acknowledges the issue of real-world counterparts in his fifth solution to the paradox of fiction.

Consider, for instance, the Omaha beach sequence of Spielberg's *Saving Private Ryan* (1998) - to be discussed in greater detail in the next chapter. When it comes to the assessment of reality-status, which has the upper hand: the fact that the film 'refers' to actual people and events (in contrast to, say, a standard fiction film), or the fact that the people have been played by actors whilst the events have been staged for the camera (in contrast to, say, a standard documentary)? Does the result of this assessment hinge on the gravity of the original subject-matter or the 'realism' of the corresponding representations?[37]

(3) High reality-status. Finishing with the 'high end' of the reality-status continuum leads us to the category of films which are externally indexed as *non-fictional*: for instance, documentaries and news broadcasts. Although non-fiction films make use of actuality footage which is apparently 'objective', this footage can be used in a variety of 'subjective' ways: for instance, it can be either placed out of context or used to perform a representative function; a documentary about the Battle of the Somme may include images taken at another part of the frontline. Alternatively, some documentaries - for example, Kevin Macdonald's *Touching the Void* (2003) - integrate interviews with staged re-enactments of the subject-matter. We need not dwell on this category, however, as the essential point has already been made in the discussion of the previous two: viz., the distinction between fiction and non-fiction (and truth and falsity) is more complex than it appears.

Frame 2.10: Assertion, partial determination, and self-relevance: *Kes* (1969)

[37] What is the reality-status of 'docu-dramas' which look to the future as opposed to the past? Consider, for example, films about the potential dangers of nuclear war: both *The War Game* (1965) and *The Day After* (1983) caused public outcries. Radford (1975) acknowledges the issue of probability in his fourth proposed solution to the paradox of fiction.

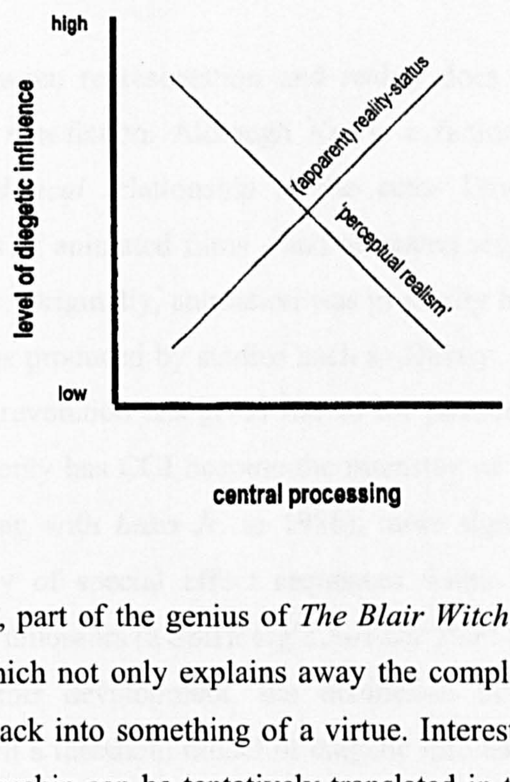
(4) Reality-status versus realism. Beyond the reality-status continuum, an additional case - which blurs the distinction between reality-status and realism - is worth mentioning. Fiction films can be *internally indexed* as non-fiction (documentary) films. *The Idiots*, for instance, removes most indications of its fictional status, whilst deliberately including devices specifically associated with the documentary (for example, the six retrospective interviews to camera). One of the most well-known examples, however, is Myrick and Sanchez's 1999 film *The Blair Witch Project* (see Frame 2.11). Although the majority of viewers were fully aware of the film's fictional status before they walked into the cinema, the film begins with a short statement claiming that it was pieced together from footage left by three student film-makers (making a documentary about the Blair Witch).

Part of the film's outstanding box-office success may lie in the fact that it sticks resolutely to its premise by *minimising* the number and salience of 'fiction markers' on the one hand, and *maximising* the number and salience of 'reality markers' on the other. To begin with, the film exploits what Grodal (2002, p.77) describes as 'imperfect perceptual realism' by using a handheld camera and low quality filmstock. All of the film's sound is (apparently) diegetic, with the possible exception of a single sound effect used in the climactic scene; significantly, Myrick and Sanchez never succumb to the temptation of using non-diegetic music to heighten the suspense. In terms of characters, the three principal actors give highly naturalistic performances: Heather Donahue's vocal expressions of fear are particularly salient. And in terms of narrative, the film-makers even go to the trouble of explaining away the fact that the three characters persist in filming each other whilst finding themselves lost in the woods. Finally, the credits are only presented at the film's conclusion.

Frame 2.11: Realism versus reality-status: *The Blair Witch Project* (1999)

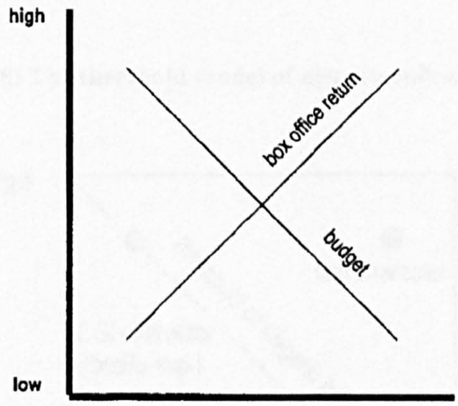
Why is the fact that *The Blair Witch Project* sticks resolutely to its premise so important? It is tempting to say that including fiction markers *during* the film would have 'shattered the illusion' that the film was a documentary, but we want to avoid the claim we are ever under an illusion in the first place. Conversely, we can hypothesise that the film's strategy of deliberately including *reality markers* influences the (largely nonconscious) assessment of reality-status. Significantly, Grodal proposes that '[a] more radical or paradoxical 'compensation' for lack of perceptual realism consists of emphasizing its shortcomings by making imperfect perceptual realism into a sign of 'reality'.' This functional, or compensatory, relationship can be described as follows: the lower the level of perceptual realism, the higher the (apparent) reality-status (see Figure 2.26).

Figure 2.26: 'Imperfect perceptual realism' versus (apparent) reality-status



In conclusion, part of the genius of *The Blair Witch Project* lies in the fact that it invents a premise which not only explains away the complete lack of production values, but also makes this lack into something of a virtue. Interestingly, then, the functional, or compensatory, relationship can be tentatively translated in the following monetary terms: the lower the budget, the higher the box-office return (see Figure 2.27). (This relationship may partly explain the recent success of the phenomenon of 'reality television'.)

Figure 2.27: Budget versus box office return

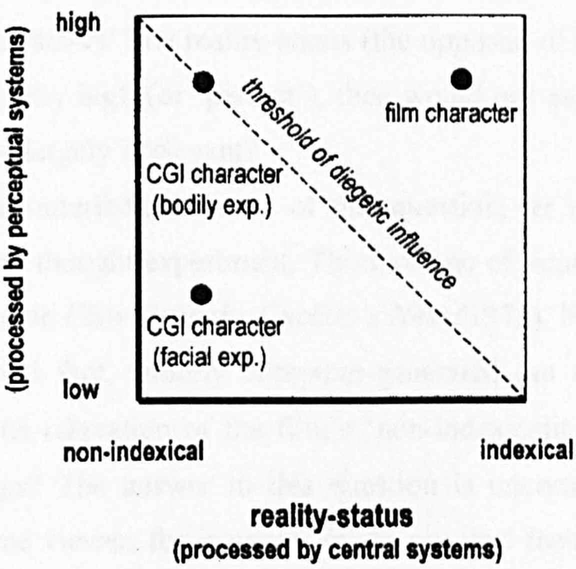


□ *Question 2b: Indexicality or non-indexicality?*

The relationship between representation and reality does not end with the distinction between fiction and non-fiction. Although *Kes* is a fiction film, the character of Billy Caspar bears an *indexical* relationship to the actor David Bradley. In contrast, the characters and events of animated films - and animated sequences - bear a *non-indexical* relationship to reality. Originally, animation was primarily hand-drawn, obvious examples including the cartoons produced by studios such as Disney. In the last twenty or so years, however, the digital revolution has given rise to the phenomenon of *computer-generated imagery* (CGI). Not only has CGI become the mainstay of the cartoon creations of Pixar Animations (beginning with *Luxo Jr.* in 1986); more significantly, perhaps, it has also become the mainstay of special effect sequences within live action films (a notable benchmark being the dinosaurs in Spielberg's *Jurassic Park* from 1993).

In light of this development, the distinction between indexicality and non-indexicality may merit a threshold model of diegetic influence in its own right (see Figure 2.28). At first glance, it seems reasonable for us to say that we are capable of taking an *indexical stance* towards live action sequences and a *non-indexical stance* towards computer-generated sequences. Given, however, that the default mode of the central systems is naïve realism - that is, 'truth' or indexicality is implicitly assumed - it is not strictly necessary for us to say that we take an indexical stance towards live action sequences. If a sequence is clearly indexed as an instance of CGI, on the other hand, then it is legitimate for us to say that we override the default mode in question by taking the non-indexical stance.

Figure 2.28: The threshold model of diegetic influence: indexicality



N.B. For the sake of clarity, the line indicating diegetic presence has been omitted.

Given the prevalence of CGI in contemporary cinema, a key question is: does CGI actually work? And, if not, is this because: (1) it is not sufficiently convincing in a perceptual sense (the factor of realism); (2) the viewer 'knows' that it is computer-generated in a cognitive sense (the factor of reality-status); or (3) some combination of both? In order to answer these questions, let us consider an extreme example. Sakaguchi and Sakakibara's *Final Fantasy: The Spirits Within* (2001) was externally indexed as the first feature-length CGI film to 'star' photorealistic human characters (see Frame 2.12). It is the year 2065: Dr Aki Ross (voiced by Ming-Na) and Captain Gray Edwards (voiced by Alec Baldwin) must discover the secrets of a race of phantom-like invaders in order to save both the planet and Ross's own life (her body is infected by alien particles). (Of particular interest is the question of whether or not the use of CGI impacts on the plausibility of the romantic subplot between the two characters.)

With respect to the factor of realism, my own impression is as follows. Although CGI is capable of rendering the characters' bodily movements in a relatively realistic fashion, it is not yet capable of rendering the 'subtleties and nuances' of their facial expressions. As a result, viewing the characters in question is a somewhat disconcerting experience, akin to continually switching between the two aspects of the Jastrow duck-rabbit ('actual human' versus 'CGI creation'). What about the factor of reality-status? Notice that in the case of CGI, the 'imperfect perceptual realism' of the characters' facial expressions effectively operates as an internal 'non-indexical' or 'CGI marker' - an indication of the characters' low reality-status (the opposite of Figure 2.26). If the level of realism was sufficiently high (or 'perfect'), then would our assessment of the characters' low reality-status be largely irrelevant?

Given the counterfactual nature of this question, let us attempt to answer it by considering a certain thought experiment. Think of one of your favourite films: say that it is Milos Forman's *One Flew Over the Cuckoo's Nest* (1975). Now imagine being told that the film is, in actual fact, entirely computer-generated (an elaborate ruse by the film industry). Would the relevation of the film's 'non-indexicality' spoil your enjoyment of subsequent viewings? The answer to this question is uncertain (and susceptible to the frame problem). One viewer, for instance, might say yes: their admiration for the film is based primarily on an appreciation of Jack Nicholson's Oscar-winning performance as Randle Patrick McMurphy - an aspect which is emphatically dependent on indexicality. Another viewer, however, might say no: their admiration for the film is based primarily on their appreciation of Ken Kesey's narrative - an aspect which is, in principle, independent of indexicality.[38]

Frame 2.12: Non-indexicality: *Final Fantasy: The Spirits Within* (2001)

[38] I am indebted to Gary Bettinson for this particular example.

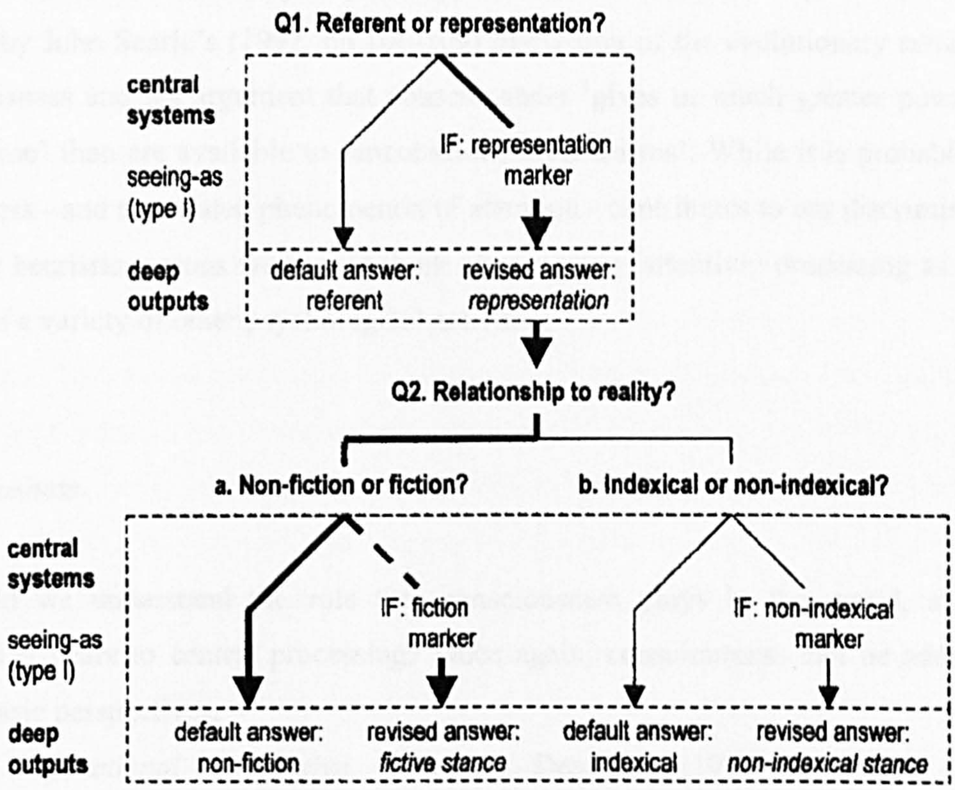
□ *Conclusion*

How should we understand the central process which assesses a film's reality-status, or, to use Spolsky's phrase, sorts the fruit from the chaff? As stated previously, Spolsky argues against Cosmides and Tooby's distinction between 'truth' (existence) and 'falsity' (non-existence), in favour of '"fitness", or appropriateness in a context'. Significantly, she goes on to claim that the assessment of fitness (and so forth) cannot be explained in terms of the 'evolved algorithms' proposed by evolutionary psychologists. In a reply to Spolsky, Cosmides and Tooby (2001) argue that the majority of Spolsky's objections hinge on an aversion to 'the "mechanistic" nature of the computational theory of mind'. In light of the above arguments, however, we can offer a somewhat different interpretation of Spolsky's position.

To begin with, the central process which assesses a film's reality-status can be classified as another instance of *seeing-as (type I)*: first, the process makes reference to factors which, in some sense, 'originate outside' the cinematic representation in the 'context' of the viewer's epistemic mental states; and second, the process proceeds in a largely nonconscious fashion (see Figure 2.29). As we have seen, the distinction between fiction and non-fiction - and between indexicality and non-indexicality - is more complex than it at first appears. On the one hand, a film may continually interweave fictional elements with non-fictional, and live action elements with CGI. On the other hand, it is possible that films are related to reality in a variety of ways. An assessment of fictionality may look beyond the values of 'truth' (existence) and 'falsity' (non-existence), other potential candidates including usefulness, coherence, assertion, partial determination, self-relevance, and probability. Similarly, an assessment of indexicality may look beyond the objective matter of whether a scene is based on live action or CGI, a potentially relevant factor being one's subjective appreciation of an actor's performance.

Considering these various complications, the main problem with Cosmides and Tooby's account is not the 'mechanistic nature' of the computational theory of mind per se. Rather, it is the possibility that the central process of sorting the fruit from the chaff must be globally sensitive, or abductive, in nature. Given that we cannot guarantee which of the listed factors will be referred to and which of them will be dominant - and given that the process is likely to be in a state of continual flux - the process in question is susceptible to the frame problem and cannot be straightforwardly explained in terms of the Classical computations originally proposed by Turing (and the 'evolved algorithms' proposed by evolutionary psychologists).[39] The end-results of this central processing can be classified as *deep outputs*. If the default mode of the central systems is naïve realism - i.e., assertion and indexicality - then it is not a case of us taking the assertive stance towards the non-fictional aspects of a film and the indexical stance towards the live action aspects; rather, it is a case of us taking the fictive stance towards the fictional aspects and the non-indexical stance towards the computer-generated aspects.

Figure 2.29: Central processing: referent or representation, relationship to reality?



N.B. This diagram refers to Radford's example of the man who tells us a 'harrowing story' about his sister. The bold full line shows the route taken by the man's story before the revelation, whereas the bold dashed line shows the route taken after the revelation.

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[39] Grodal (1997, pp.32-35) proposes that the assessment of 'reality-status' occurs at 'global level', whilst Branigan (1994, Ch. 7) proposes that the 'mental process of assigning reference' operates in a 'top-down' fashion.

2.5 OTHER MYSTERIES OF THE MIND

(a) Attending to the world: conscious (attentive) processing

The story does not end there. According to Fodor (2000, p.99), there are two primary candidates for the 'ultimate mystery' of the mind, the first being central processing of the abductive nature described and the second being consciousness. When I first considered the question of how we discriminate the world from the cinema, I assumed that the answer lay somewhere in the latter mystery as opposed to the former. In particular, I was influenced by John Searle's (1992, pp.106-109) discussion of the evolutionary advantage of consciousness and his argument that consciousness 'gives us much greater powers of discrimination' than are available to 'unconscious mechanisms'. While it is probable that consciousness - and the related phenomenon of attention - contributes to our discriminatory powers, for heuristic reasons we should think of conscious (attentive) processing as being dedicated to a variety of other psychological activities.

(i) Consciousness

How should we understand the role that consciousness plays in the world, and the relationship it bears to central processing? Once again, consciousness can be addressed from two basic perspectives.

(1) A functional perspective. Following Dennett's (1978) discussion of the relationships between philosophy, psychology, and artificial intelligence, Currie (1995, pp.83-84) conceives of the mind as a 'hierarchy' of homunculi, with the least intelligent homunculi - for example, the 'object recognition capacities' cited above - occupying the lowest level and the most intelligent homunculus - namely, 'the person or agent' - occupying the highest. Significantly, Currie states: 'Many operations of the mind are conducted by the person himself; judging that there is a horse in front of me, or that there is a picture of a horse in front of me, is something that *I* do.' Although the homuncular view of the mind is similar to the modular view described throughout this chapter, Currie's claim that a judgement is 'something that *I* do' is problematic in at least two respects. First, we should make a distinction between 'operations' of the mind which are consciously controlled, and central processes whose 'deep outputs' are merely accessible to

consciousness. Although the predicate 'to judge' can be only properly assigned to the person themselves, it is probable that the central processes underlying our capacity to discrimate, say, a picture of a horse from an actual horse proceed in a 'largely nonconscious' fashion. Second, we should think of the person as 'emerging' from the hierarchy as a whole rather than occupying the highest level alone. In a later work, for instance, Dennett (1991, p.218) proposes that the conscious mind does not reside in a 'Cartesian theatre'; instead, it is best thought of as a 'serial virtual machine' which is 'implemented - inefficiently - on the parallel hardware that evolution has provided for us'.

(2) A neurobiological perspective. Gerald Edelman and Giulio Tononi (2001) make a distinction between two types of consciousness. *Primary consciousness* is thought to exist in both humans and animals, and entails an awareness of the world (and the present). This awareness is based on the capacity to relate current perceptual categorizations with conceptual categorizations from memory - thereby forming a coherent 'scene' of objects and events - and requires the integration of the different sensory modalities with the frontal, temporal, and parietal areas of the brain. Building on the foundations of primary consciousness, *higher-order consciousness* is thought to exist in humans alone, and entails an awareness of both the world and the self (along with the past, present, and future). This awareness is based on the capacity to make both semantic and syntactical categorizations - enabling us to refer to objects and events by 'symbolic means' - and requires the integration of the aforementioned brain areas with, for instance, the Broca's and Wernicke's language areas. Edelman and Tononi's account supports the theory that there is no Cartesian theatre where everything 'comes together'; rather, the 'unified' and 'indivisible' nature of our conscious experience is based on a 'dynamic core' of neural activity which is distributed across the whole brain, the 'binding' of the various elements in question being achieved through an ongoing process of 'reentrant looping'.

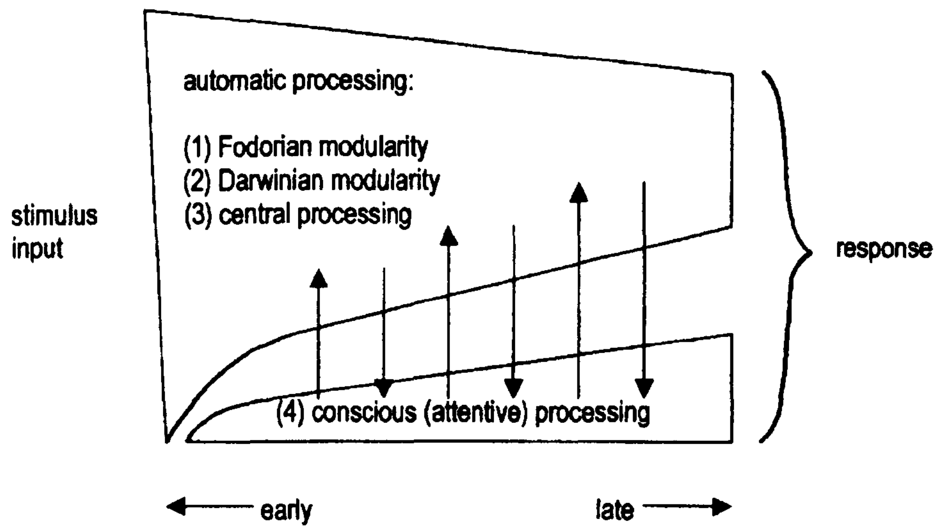
(ii) Attention

The role of consciousness can be clarified by turning to a related phenomenon. Grodal (1997, p.32) suggests that the assessment of reality-status involves 'part of our limited capacity for conscious attention'. Although Grodal possibly conflates the operations of 'conscious attention' with those of (nonconscious) central processing in the manner described above, his account suggests that the terms 'consciousness' and 'attention' are approximately synonymous. Dirk Eitzen (1993) proposes a *parallel processing model of selective attention* in an attempt to explain why 'we experience difficulty in simultaneously attending to a movie as both an illusion and a construct'. According to this model, *automatic processing* is analogous to peripheral vision on the grounds that it is 'unlimited', parallel, and largely beyond conscious control. By way of example, Eitzen refers to capacities like object categorization and phoneme perception - both candidates for Fodorian modules or Dennett-style homunculi. *Attentive processing*, on the other hand, is analogous to foveal vision on the grounds that it is 'limited', serial, and within conscious control. Presumably, this capacity 'emerges' from the parallel architecture described.

Given the obvious similarities that Eitzen's model bears to Dennett's homuncular view of the mind, and given the obvious similarities that the homuncular view bears to the modular view described throughout this chapter, the answer to the conundrum may lie in combining the three models, thereby yielding the following hypothesis (see Figure 2.30). When engaging with the cinema, *automatic processing* - operating in a 'parallel' fashion - will perform a huge variety of psychological tasks. As we have seen, Fodorian modules will be concerned with the perception of depicted characters and events, Darwinian modules will be concerned with the cognition of intentionality and emotional significance, and central processing will be concerned with discriminating the film as a 'construct' whilst assessing the relationship that this 'construct' bears to reality.[40] Simultaneously, *conscious (attentive) processing* - operating in a 'virtual' and 'serial' fashion - will be focused on the film's 'illusory' content: that is, the perceptual qualities of the diegesis as a spectacle and the cognitive qualities of the diegesis as a narrative. It is plausible that both types of processing are in a state of continual dialogue and flux, central representations moving in and out of conscious awareness.

[40] In addition, 'orienting response' mechanisms (otherwise known as 'demons') - operating in or around the perceptual systems - will be continually monitoring the environment of the theatre for potentially significant changes: for example, two people talking or a person walking down an adjacent aisle.

Figure 2.30: Parallel processing model of conscious (attentive) processing



Adapted from Figure V from Eitzen (1993), p.54.

(b) Attending to the cinema: seeing-as (type II)

How should we understand our conscious (attentive) relationship to the cinema? Given that the operations of conscious (attentive) processing may either support or contradict the 'conclusions' of central processing described above, we need to re-consider the two questions cited previously by appealing to the *intentional level of explanation.*

(i) Question 1: Referent or representation?

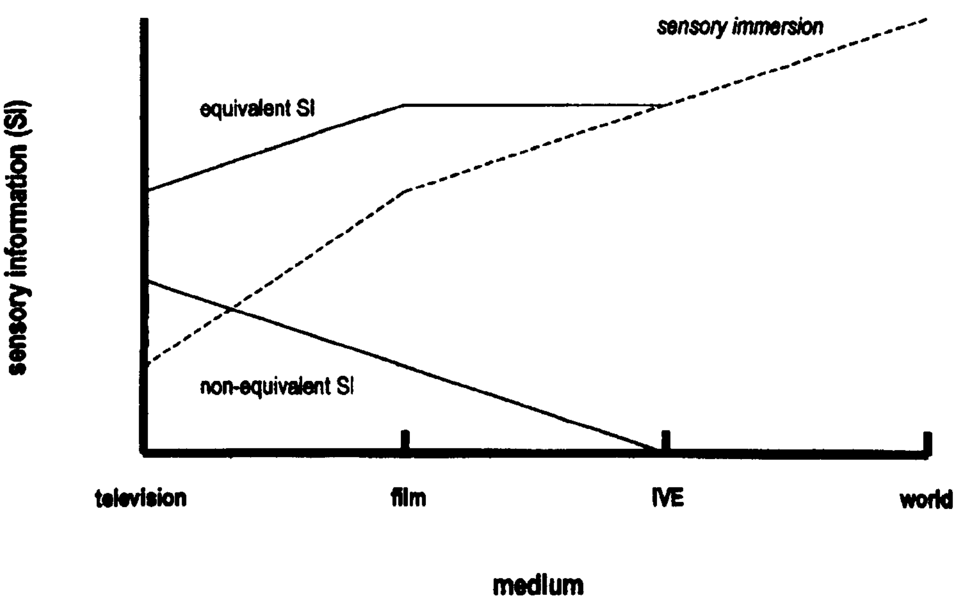
The impact of conscious (attentive) processing on the 'referent / representation' question can be addressed by introducing the notion of *seeing-as (type II).* The general root 'seeing-as' is relevant because conscious (attentive) processing shares certain similarities with central processing as described above: that is, it makes reference to factors which, in some sense, 'originate outside' the cinematic representation in the 'context' of the viewer's psychology. The 'type II' qualification is necessary because our conscious (attentive) processing differs from central processing in at least one significant respect: by definition, it proceeds in a largely conscious (attentive) fashion.

The first potential example of seeing-as (type II) can be thought as going *with* the grain and can be understood in terms of the diegetic effect and *sensory immersion.* Following Pirenne and Polanyi's (1970) discussions of painting, Carroll (1988, pp.43-44) proposes that we are *focally aware* of what a film depicts (ie., the referent), and *subsidiarily aware* of the film as a representation (also see Smith, 1995b, p.120). This distinction can be taken one step further by returning to the research on immersive virtual environments (IVEs). Blascovich (2001) describes an IVE in which subjects are required to walk across a plank which traverses 'The Pit'; although the image of the pit does not 'fill' the subjects' field of view, the HMD obscures their actual environment. In light of the above, it seems reasonable to say that the subjects are 'focally aware' of the pit's apparent depth but 'subsidiarily aware' that they are actually situated in a room with a solid floor. Nevertheless, the majority of subjects refuse to step onto the plank. Putting the factor of interaction to one side, Blascovich's anecdote suggests that two relationships are of importance. First, the level of sensory immersion can be thought of as a function of 'equivalent' minus 'non-equivalent' sensory information (see Figure 2.31a). Second, the *higher* the level of sensory immersion, the *lower* the level of subsidiary awareness regarding a representation's virtual status (see Figure 2.31b). (Blascovich's anecdote also suggests that the central process which discriminates representation from referent may be heavily reliant on the 'residual cues' presented by the subject's actual environment.)

How do these two relationships apply to film? Following Eitzen's (1993) lead, let us answer this question by using the operations of vision as a guide to, or an analogy for, the operations of attention, and by comparing film viewing with its televisual counterpart. We can gain some idea of the impact of *equivalent visual information* by considering the role of focal attention / foveal vision. Focal attention has been compared to both a spotlight and a zoom lens: although it does not necessarily entail foveal vision, the two tend to coincide. Foveal vision involves the 'high acuity' regions in the centre of the retina and occupies only one or two degrees of the field of view - the size of a thumbnail held at arm's length. Although the act of focusing on central cues is within our conscious control, we tend to focus on the light and moving areas of our visual field. Both of these facts favour film over television. The larger the screen - and the closer our viewing position - the higher the 'acuity' of the depicted characters and events, whilst in the theatre (but not the home), the central cues of light and movement will be presented exclusively by the projected image.

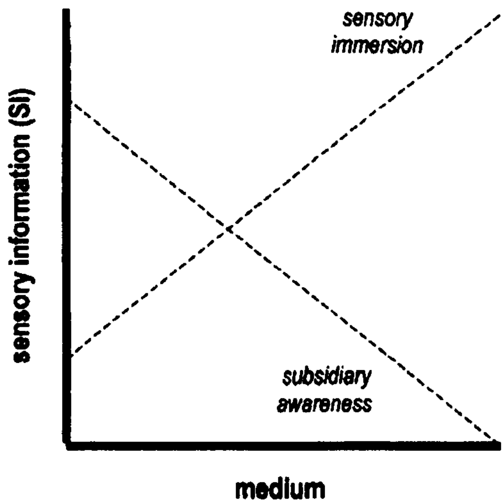
Conversely, the impact of *non-equivalent visual information* can be addressed by considering the role of subsidiary attention / peripheral vision. By implication, subsidiary attention and peripheral vision also tend to coincide; peripheral vision involves the 'low acuity' regions in the periphery of the retina and occupies the majority of the FOV. Although peripheral cues tend to elicit 'automatic shifts of attention', the presentation of peripheral cues can be controlled to a greater or lesser extent. Once again, both of these facts favour film over television. The larger the screen - and the closer our viewing position - the lower the 'acuity' of the screen's edges, whilst in the theatre (but not the home), the peripheral cues of the screen's surroundings will be minimised by the lighting conditions.

Figure 2.31a: Seeing-as (type II): sensory immersion



N.B. Sensory immersion is calculated as a function of equivalent minus non-equivalent sensory information (SI). The numbers are arbitrary and included for illustrative purposes.

Figure 2.31b: Seeing-as (type II): sensory immersion versus subsidiary awareness



The second potential example of seeing-as (type II) effectively goes *against* the grain. If we are capable of consciously attending to what the film depicts (the referent), then are we also capable of attending to the film as a representation, thereby over-riding the default mode of naïve realism? The notion of 'seeing-as' is relevant for the following reasons. Anderson (1996, pp.43-49) notes that a film presents 'two sets of information': one for a three-dimensional 'scene' and one for a two-dimensional 'surface'. On the basis of this observation, Anderson effectively offers a solution to the paradox of fiction: he claims that engaging with a fiction film is 'not a matter of suspending disbelief'; rather, the visual system 'alternates' between the two percepts in question, thereby creating a 'dual awareness'. Although Anderson's theory is capable of accounting for our experience of ambiguous figures like the Jastrow duck-rabbit (as noted previously), it is incapable of accounting for our experience of film viewing. If the viewer is a sufficient distance from the screen (and so forth), then the screen itself will be imperceptible: therefore, the 'alternation' in operation is not between two states of perceptual awareness; rather, it is between a perceptual awareness of the scene and a central 'awareness' of the existence of the screen's surface.

The 'type II' qualification is added because seeing a three-dimensional scene as a two-dimensional surface requires conscious effort. Here, a Fodorian account reveals the following irony. On the one hand, our capacity to see the 'aspects' of an image (i.e., the 'scene' rather than the 'surface') - a possible candidate for a relatively advanced *cognitive* activity according to the mental interpretation theory of vision described by Turvey - is dependent on *perceptual* analysis alone. On the other hand, our capacity to perceive an image in terms of its 'material properties' - an obvious candidate for a relatively basic perceptual activity - is actually dependent on conscious (attentive) processing.

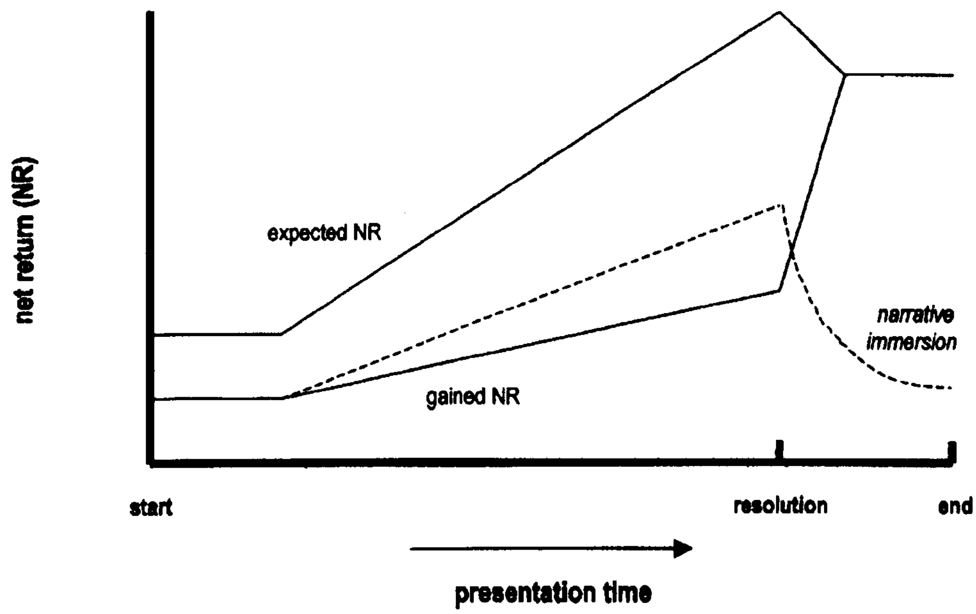
(ii) Question 2: Relationship to reality:
fiction or non-fiction, indexicality or non-indexicality?

A re-consideration of the 'relationship to reality' question can be also framed in terms of seeing-as (type II). As last time, the first potential examples of seeing-as (type II) can be thought of as going *with* the grain; this time, however, they can be understood in terms of the diegetic effect and *narrative immersion.* Ed Tan (1996) argues that our primary emotion when viewing a fiction film is one of 'interest', where interest is approximately synonymous with attention (although it also involves the inclination to act). In particular, interest encourages us to devote our limited processing resources to following a film's narrative (the structure of which is described by Bordwell, 1985). The two primary determinants of interest are 'thematic structures' and 'character structures' which influence our expectations regarding the outcome of the plot ('cognitive concerns') and the fate of the characters ('affective concerns') respectively. From our perspective, Tan's account suggests that two relationships are of importance. First, at any given point in a film, the level of interest (read: narrative immersion) can be thought of as 'a function of expected minus gained returns' (see Figure 2.32a). Second, the *higher* the level of narrative immersion, the *lower* the level of subsidiary awareness regarding the film's fictional and/or non-indexical status (see Figure 2.32b).

How do these two relationships apply to live action and computer-generated films? The question about live action films can be answered by considering Tan's own remarks about Hitchcock's *The 39 Steps*. When the beautiful female spy is murdered by an unknown assailant, we hypothesise that Richard Hannay is innocent on the one hand (a cognitive concern), and 'we hope that this is the case' (an affective concern) on the other (p.92). A consideration of cognitive concerns can be used to bring the *intentional stance* back into the picture. In our discussion of Darwinian modularity, it was suggested that we read Hannay's mind in a 'swift' and 'effortless' fashion, in light of certain narrative developments - an instance of regarding-as (type II). At the level of conscious (attentive) processing, it is plausible that these assessments will be more or less duplicated; that is, we consciously and attentively hypothesise about what Hannay might be thinking and feeling, and what the narrative might have in store for him - an instance of seeing-as (type II). A consideration of affective concerns, on the other hand, brings us back to the *emotional stance*. In our discussion of Darwinian modularity, it was suggested that potential threats to Hannay's freedom will be assessed by what Ekman (2003, p.21) describes as 'auto-appraisers'. At the level of conscious (attentive) processing, it is plausible that these threats will be assessed in terms of what Ekman (ibid., p.24) describes as *reflective appraising*. The two relationships may account for the possible success of *The 39 Steps* in the sense that a sufficient level of narrative immersion allows us to 'forget' that Hannay is played by the actor Robert Donat.

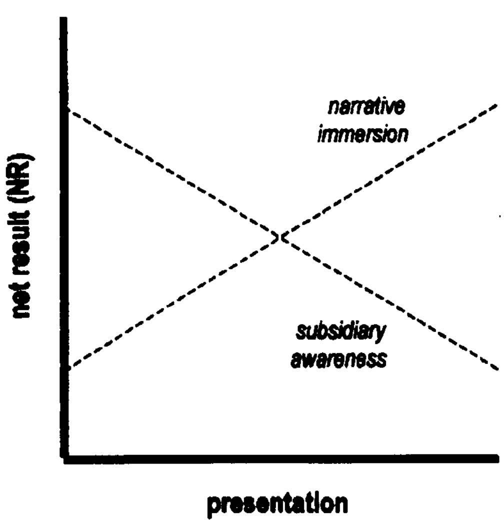
The question about computer-generated films can be answered by briefly returning to our discussion of *Final Fantasy: The Spirits Within*. Recall that Dr Aki Ross and Captain Gray Edwards must discover the secrets of a race of phantom-like invaders in order to save both the planet and Ross's own life. Although we may hypothesis that the characters will succeed in their mission (a cognitive concern) on the one hand, given the limitations of CGI described above, we may not *hope* that they will do so (the absence of the corresponding affective concern) on the other. The two relationships may account for the possible failure of *Final Fantasy* in the sense that an insufficient level of narrative immersion does *not* allow us to 'forget' that the characters of Doctor Aki Ross and Captain Gray Edwards are computer-generated. (This provides us with a further example of a complex interaction between different levels of processing.)

Figure 2.32a: Seeing-as (type II): narrative immersion



N.B. Based on Figure 4.2 from Tan (1996), p.114. Narrative immersion is calculated as a function of expected minus gained returns.

Figure 2.32b: Seeing-as (type II): narrative immersion versus subsidiary awareness



The second potential examples of seeing-as (type II) effectively go both *with* and *against* the grain. If we are capable of consciously attending to a film's content, then are we also capable of deliberately adopting various stances towards it? In the previous section on central processing, we saw that if the default mode of a computational system is 'naïve realism', then both the assertive and indexical stances are superfluous. At the emergent level of the 'person', however, it is plausible that we can take whatever stance we choose to whichever aspect of the film, in order to either further 'engage with' or 'detach from' the film's content.

With respect to *engagement strategies*, we can take an assertive stance towards a fiction film - or an indexical stance towards a computer-generated film - by telling ourselves that, although the events in question may not have taken place, similar events *could* have taken place in the past, or *will* take place in the future, or *are* taking place in the present (albeit to different people in different places). In a similar vein, Carroll (1988, pp.99-100) suggests that what the notion of 'suspending disbelief' really amounts to is our decision not to criticise certain 'narrative improbabilities'. With respect to *detachment strategies*, on the other hand, if the suspense of a thriller becomes too intense or the gore of a horror film too graphic, we can take a fictive stance towards the film by reminding ourselves that the film is only an artefact, that the characters are played by actors, that the events have been staged for the camera, and so on. Similarly, if the film is computer-generated, we can take a non-indexical stance towards the film by reminding ourselves of this very fact.

2.6 CONCLUSION

(a) A preliminary solution to the paradox of fiction

Having outlined a modular (and computational) view of the mind/brain from both a functional and a neurobiological perspective, we are in a position to offer a preliminary solution to the paradox of fiction. To recap, the main strategy is to revise the third proposition of the paradox, whilst the second strategy is to revise the Cartesian framework which underlies the paradox as a whole.

(i) Revising the third proposition

In the first half of the chapter, we outlined a direct approach to revising the third proposition (see Table 2.9). Following Turvey's seeing theory - and Wittgenstein's discussion of the verb 'to see' - we identified two types of 'regarding-as'. Film viewing effectively poses a series of questions; each of these questions is answered by a different 'level' of the mind/brain. The first question is: what and where are the objects and events in my environment? The answers are provided by Fodorian modules which produce shallow outputs in the form of perceptual, and phenomenological, content. (Given that the default mode of any perceptual system is naïve realism, we need not describe this content as having existential import.) Examples of the second question are: what are the intentions of the agents in my environment, and what is the emotional significance of my situation? In this case, the answers are provided by Darwinian modules which produce shallow outputs in the form of intentional and emotional stances. Significantly, both of these levels of processing are encapsulated from existence beliefs.

In the second half of the chapter, we went beyond Turvey's seeing theory - whilst continuing to follow Wittgenstein's discussion of the verb 'to see' - by identifying two types of 'seeing-as'. Once again, film viewing effectively poses a series of questions which are answered by different 'levels' of the mind/brain. The third set of questions is: is that a representation or the referent itself, and what relationship does the representation bear to reality? The answers are provided by central processing which produces deep outputs in the form of perceptual beliefs on the one hand, and fictive and non-indexical stances on the other. The fourth and final question is: how should I (the viewer) attend to the representation? In this case, the answer is provided by conscious (attentive) processing which produces deep outputs in the form of either fictive or assertive stances, and either non-indexical or indexical stances. Significantly, both of these levels of processing make reference to the exact *opposite* of existence beliefs: namely, *non*-existence beliefs.

Table 2.9: A preliminary solution (I): revising the third proposition

	questions (domain)	answers (outputs)	reliance on existence beliefs?
(1) Fodorian modularity **- regarding-as (type I)** **- direct perception**	perceptual scene analysis: (i) what? (ii) where?	shallow: (i) basic categorizations (ii) basic localizations	no: complete encapsulation
(2) Darwinian modularity **- regarding-as (type II)** **- affordances**	mind-reading / emotional appraisal: (i) intentions? (ii) significance?	shallow: * (i) intentional stance (ii) emotional stance	no: partial encapsulation
(3) central processing **- seeing-as (type I)**	fixation of perceptual belief: (i) referent or representation? (ii) relationship to reality?	deep: (i) perceptual beliefs (ii) fictive stance, non-indexical stance	no: reliance on non-existence beliefs
(4) conscious (att.) proc. **- seeing-as (type II)**	attentional tasks: (i) referent or representation? (ii) relationship to reality?	deep: (i) sensory immersion (ii) narrative immersion (various stances)	no: reliance on non-existence beliefs

* Also see physical, biological, and social stances.

(ii) Revising the Cartesian framework

Many film theorists assume that the viewer is a Cartesian ego: in other words, they only refer to one level of processing - hence, the problem of contradictory mental states. Other film theorists refer to as many as two levels of processing: for example, Smith (1995b) makes a distinction between the 'sensory' and the 'epistemic', whilst Grodal (1997) makes a distinction between the 'local' and the 'global'. In this chapter, we have referred to not two, not three, but *four* levels of processing (see Table 2.10); a distinction which serves to combine either the sensory or the epistemic on the one hand, with either the local or the global on the other to produce four different permutations.

Table 2.10: A preliminary solution (II): revising the underlying framework

	sensory or epistemic?	local or global? *
(1) Fodorian modularity	sensory	local
(2) Darwinian modularity	epistemic	local
(3) central processing	epistemic	global (non-conscious, parallel)
(4) conscious (attentive) processing	both	global (conscious, 'serial')

* 'Local' and 'global' are relative terms.

(b) Further applications

In addition to making a modest contribution to the field of cognitive film theory, the four-fold distinction outlined in this chapter is intended to make a modest contribution to certain debates in both philosophy and science - a theme which will recur throughout the following chapters.

(i) Distinctions in philosophy

Although in a strict sense, film viewing only involves one type of access to the corresponding world (namely, perceptual access) whereas real world interactions involve two (both perceptual and enactive), film viewing is more complex than its real world counterpart in one significant respect: viz., the subject (or viewer) is effectively in *two* situations at the same time. In order to account for this duality, the film theorist is obliged to make distinctions - by referring to additional levels of processing - which the philosopher who is concerned with real world interactions may overlook. To borrow a phrase from the philosopher Stephen Stich (1978, p.517), however, it is possible that these distinctions 'mark real and psychologically interesting boundaries' which play a significant role *outside* the cinema.

(ii) Distinctions in science

Considering the duality of film viewing, the film theorist is also obliged to make distinctions which may be overlooked by the scientist - especially, the evolutionary psychologist. First, the distinction between Fodorian and Darwinian modularity is not made explicit in the literature: evolutionary psychologists tend to assume that both types of module have the same ontological status as 'adaptations'. As we have seen, however, the two differ in a significant number of respects - notably, the properties of informational encapsulation and psychophysical detectability - to be treated as separate entities. Second, the distinction between modularity and central processing is not given the attention it deserves: although evolutionary psychologists acknowledge the role of more general-purpose mechanisms, they tend to ignore the more global, or abductive, aspects of cognition. It seems likely, however, that the frame problem really is a problem. Third and finally, the distinction between central processing and conscious (attentive) processing is not usually made: given that evolutionary psychologists disregard the former whilst assuming that adaptations operate below the latter, the relationship between the two does not tend to arise. The subject is capable, however, of making (nonconscious) abductive inferences about their environment in one respect, whilst consciously attending to the environment in another.

CHAPTER 3

Outlining a Multi-Level Model of the Emotion System: Ways of Reacting to the World and the Cinema

CHAPTER 3

Outlining a Multi-Level Model of the Emotion System: Ways of Reacting to the World and the Cinema

3.1 INTRODUCTION [1]

(a) Understanding emotions in the world

The third proposition of the paradox of fiction can be revised by eliminating so-called 'existence beliefs' from the psychological equation. As we have seen, the most obvious way of undertaking this task is to consider direct theories of psychological engagement. In the previous chapter, we considered the first half of our 'direct relationship' to the world and the cinema by focusing on the 'seeing stage' of the reception process; in total, four different ways of 'seeing' the world and the cinema were described. In this chapter, we will consider the second half of this direct relationship by turning to the *reacting stage* of the process; in particular, we need to understand how the different types of information already described feed into the emotion system, how the emotion system assesses this information, and how the emotion system initiates (appropriate) responses.

How should we understand emotions? It makes sense to begin our investigation in the world itself by providing a working definition of the term 'emotion' and a brief overview of the emotional process. Following Robert Solomon (2000, pp.3-15), we can approach this task by asking a 'why' question and a 'what' question respectively.

[1] The term 'reacting' in the chapter title is inspired by Wittgenstein's (1958) discussion of the verb 'to see', and his claim that we 'react' to both a human face and a picture of a face in similar, if not identical, ways. An early version of this chapter was presented at a conference organised by the Laterna Magica Assocation, University of Pécs, Hungary (2001). Thanks to László Tarnay for translating this paper for the Hungarian journal *Passim* - see Barratt (2005). Thanks also to Howard Bowman for reading and commenting on the version in question. Later versions of the chapter were presented at postgraduate seminars organised by the Center for Evolutionary Psychology and the Department of Psychology, University of California, Santa Barbara (2003).

(i) 'Why' are our reactions?

In contrast to the traditional Western or Romantic view - which assumes that emotions are the enemy of reason - let us follow the recent comments of cognitive film theorists by assuming that emotions are functional processes which complement both perceptual and cognitive activities. According to the *prototypical view of emotion* advanced by many cognitivists, for instance, emotions have 'object-', 'goal-', and 'action-orientation'. This view can be illustrated by appealing to the prototypical emotion of fear and the prototypical example of a fear situation - originally cited by the 'father' of American psychology, William James (1884). If we encountered a threatening bear in the woods, the object of our emotion would be the bear itself, the goal in operation would be self-preservation, whilst the appropriate action would be to run in the opposite direction - preferably, as quickly as possible. In such an encounter, the emotion of fear would serve to co-ordinate the operations of our perceptual (and attentional) systems, cognitive-motivational systems, and physiological and behavioural systems.[2] (As we will see, this type of example lends itself to our understanding of mainstream narrative films which usually feature purposeful characters facing various obstacles, and so forth.)

Many emotion theorists make a distinction between two groups of emotions (see Table 3.1). By common consensus, the *primary* (or *basic*) *emotions* are thought to include fear, anger, disgust, sadness, and happiness: these emotions are associated with both specific facial expressions and specific physiological patterns, and tend to occur universally. (The philosopher Paul Griffiths, 1997, refers to primary emotions under the rubric of 'affect programs'.) The *secondary* (or *complex*) *emotions*, on the other hand, are though to include embarrassment, guilt, jealousy, love, pride, and shame: these emotions are not associated with either specific facial expressions or specific physiological patterns, require a greater degree of cognitive processing, and tend to vary across cultures. (Griffiths refers to secondary emotions under the rubric of 'higher cognitive emotions'.)

Each primary and secondary emotion can be regarded as performing a different function, with respect to a different type of human situation. Of course, some emotions may be less obviously functional than others. Similarly, it is not difficult to think of instances in which emotions are a detriment rather than a benefit, and each of the emotions

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[2] One could argue that the emotion of fear *comprises* such processing. In this respect, the encounter with the bear could be described without referring to the terms 'emotion' and 'fear' at all; the terms are merely a way of assigning significance to certain situations, from the perspective of the observer.

is associated with a particular disorder. An evolutionary approach, however, may provide the answers we require: on the whole, a particular emotion served our ancestors well in a particular type of situation, whilst a less obviously functional emotion such as sadness is the inevitable price you pay for (adaptively) valuing an object or goal which is lost. In addition, one of the behaviours associated with sadness - namely, crying - may perform a communicative function. (Given that emotions have been defined as functional processes with respect to real world situations, how does this functionality persist in the unusual case of film viewing? Are emotional responses to fictional - i.e., non-existent - characters and events functional in any conceivable sense?)

Table 3.1: 'Why' are our reactions?

primary emotions (affect programs)	**secondary emotions (higher cognitive emotions)**
fear	embarrassment
anger	guilt
disgust	jealousy
sadness (distress)	love
happiness (joy)	pride
surprise (?)	shame

Adapted from Evans (2001), p.7 and p.29.

(ii) 'What' are our reactions?

The emotional process can be broken down into three basic stages; namely, the input, induction, and response stages. Each stage can be broken down further into individual components. Let us summarise each of these stages and components in turn (see Table 3.2).

(1) The input stage. Our emotions are usually 'about' something. For the sake of simplicity, let us assume that an emotion begins with the 'perception' of some sort of object or event which has emotional significance. Whereas an object may be immediately evident to the senses, an event can be as abstract as a meaning or implication. Both are of

relevance to film which is both an audiovisual medium dealing in sights and sounds, and a narrative medium dealing in meanings and implications.

(2) The induction stage. Following a simple cause-and-effect logic, it is reasonable to assume that some sort of process must intervene between the 'perception' of an object or event and the initiation of an (appropriate) emotional response. Determining the exact nature of this process is problematic, however. From a *neurobiological perspective*, neuroscientists attempt to identify the anatomical structures which 'underpin' emotion. Although the cortex is thought to be involved in many aspects of emotion, regions of the (subcortical?) limbic system have been singled out in particular. From a *cognitive perspective*, on the other hand, psychologists propose that an object or event is 'cognitively appraised' for its emotional significance; this appraisal makes reference to the subject's goals or concerns. At this point, we should mention a general rule: the more abstract the object or event, the higher we must go in the mind/brain, both anatomically and functionally; and given the limitations of the neurobiological, the more we will have to rely on a cognitive level of explanation.

(3) The response stage. Our emotional responses are comprised of at least three sub-components. The *physiological component* is mediated by the internal organs (the viscera) and includes changes in heart rate, respiration, and so forth. The *behavioural component*, on the other hand, is mediated by the skeletal muscles (the soma) and includes both instrumental behaviours (for example, the flight action associated with fear) and expressive behaviours (displayed by the face, body, and voice). The *subjective component* can be thought of as the conscious, 'qualitative' experience of both the physiological and behavioural components in conjunction with the cognitive component described above: for example, the feeling of 'butterflies in the stomach' along with the appraisal that one is about to sit an exam or attend an interview. (When most people talk about emotions, it is to this particular component that they are referring.)

Table 3.2: 'What' are our reactions?

	questions to be addressed
(1) input stage	stimuli, cues, or situational meaning?
(2) induction stage	affective appraisal or cognitive appraisal?
(3) response stage	bodily feedback: necessary or sufficient?

N.B. Each stage and component of the emotional process raises a series of question which have been hotly debated: see Ekman and Davidson (1994). Also see Strongman (1996) for a review of different emotion theories.

(b) Understanding emotions in the world and the cinema

Given that direct theories posit an 'intimate connection' between 'seeing' and 'reacting' (Messaris, 1997, p.4), how should we understand the nature of this connection? And having provided a brief summary of why and how we react to objects and events in the world, how should we understand our reactions to the objects and events presented by cinema?

(i) A Wittgensteinian / Gibsonian approach to 'reacting'

As we have seen, the first example of a direct approach is provided by Wittgenstein's (1958) discussion of the verb 'to see'. With respect to the seeing theory, Turvey (1997) applies the notion of 'regarding-as' to the case of emotion by citing a single quote from Wittgenstein: 'In some respects I stand towards [a 'picture-face'] as I do towards a human face. I can study its expression, can react to it as to the expression of the human face.' (p.194) By conceptually relating perception and emotion, Turvey provides us with a possible way of eliminating (conscious) mental activity - and hence, existence beliefs - from the equation. By choosing to dismiss causal mechanisms and processes of which we are unaware, however, he provides us with an incomplete account of this relationship. The second example of a direct approach is provided by Gibson's (1979) ecological approach to visual perception. Anderson (1996) recognises that Gibson's notions of 'direct perception' and 'affordances' are a 'priceless gift for film theory'. By doing so, Anderson opens the way for an ecological (and computational) way of understanding the intimate connection between perception and emotion. By only referring to causal mechanisms and processes in relation to the perceptual half of the equation, however, he leaves the emotional half in need of further description and explanation.

(ii) A multi-level / neurobiological approach

In light of these shortcomings, the direct theory must be supported and elaborated by considering what are known as *multi-level theories* of the mind/brain: multi-level theories propose that the mind/brain consists of a number of different 'systems' or 'levels', each level or system dealing with a different type of information processing. This will allow us to understand the relationship between both (modular) perceptual systems and (non-modular) central systems on the one hand, and our emotion system on the other. How, though, should we undertake this task? Although Fodor (1983) makes a distinction between perception and cognition, he is silent on the subject of emotion (and the whereabouts of the emotion system). The answer may lie in a shift, or rather a reversal, of perspectives - a reversal which privileges a *neurobiological* level of explanation. As we have seen, Fodor starts his investigation of the mind by taking a functional perspective (concentrating on the notions of 'domain specificity', 'informational encapsulation', and the like), and ends by acknowledging a neurobiological one (briefly citing the notions of 'fixed' and 'equipotential neural architecture'). In contrast, we should approach our investigation of the emotions - and the emotion system - from the opposite direction by starting from a neurobiological perspective and ending with a functional one. In particular, we will concentrate on the research of two prominent neuroscientists: namely, Joseph LeDoux and Antonio Damasio.

What do I mean when I talk of adopting a neurobiological perspective? Many theorists seem to severely underestimate the explanatory power of an account of the mind which is informed by what Radford (1975, p.67) describes as 'biological reasons'; indeed, I suspect that they fail to conceive of what such an account might look like. This failure may be based on at least two basic, and related, assumptions. The first assumption is that a neurobiological approach operates at an inappropriate level of description. In his 2002 book *Synaptic Self*, for instance, LeDoux is concerned with the neurobiological basis of the 'self'; his key claim is that 'you are your synapses' (p.ix). In a review of the book, Fodor (2002) criticises LeDoux for focusing on a *microscopic level* of analysis: referring to electrochemical processes which take place across the synapses between neurons is unlikely to capture what distinguishes one person from another. The second assumption is that a neurobiological approach generates *uninformative (or trivially true) statements*: for instance, there is nothing intrinsically illuminating about the claim that a particular part of the brain (call it A) 'lights up' when a certain task (call it x) is performed. In the same review, Fodor states that for many philosophers and psychologists, the neurobiological substrate of psychological processes is of little interest: he jokes that the mind could be made out of cardboard for all they cared, although 'it wouldn't wear well in wet weather'.

Although both of these assumptions seem reasonable at first glance, they can be challenged in convincing ways. The first assumption fails to recognise that there are many different levels of explanation at play within neurobiology itself. In the 1998 book *The Emotional Brain*, LeDoux is concerned with the neurobiological basis of the emotions; from our perspective, one of his key claims is that 'anatomy can illuminate psychology' (p.170). Significantly, LeDoux focuses on a *macroscopic level* of analysis: he identifies the (neuro)anatomical structures - and pathways - which 'underpin' the primary emotion of fear, notably singling out an almond-shaped area of the limbic system called the *amygdala*. The second assumption fails to recognise that a neurobiological approach is capable of generating *informative (non-trivial) statements* in the following respect: aspects of our psychology can be 'illuminated' by considering the claim that anatomical structure A (which underpins function x) is connected to anatomical structure B (which underpins function y), and so forth. With respect to emotion, LeDoux claims that the amygdala - as the neuroanatomical structure which underpins fear - is connected to a number of other brain areas underpinning a number of other 'cognitive' functions. He states: 'It is not unreasonable to suggest that by knowing what the different inputs to the amygdala are, and having some idea of what function those areas play in cognition, we can get some reasonable hypotheses about what kinds of cognitive representations can arouse fear responses.' (p.169) (This type of possibility is briefly acknowledged by Fodor, ibid., though not in relation to the work in question.)

Whereas LeDoux gives a more detailed account of the earlier stages of the emotional process, Damasio (1994, 1999) gives a more detailed account of the later stages. In particular, he argues for the importance of the body proper by describing the roles of somato-visceral feedback and the somatosensory structures of the brain.

* * *

In brief, my aim in this chapter is to offer a *primary solution* to the paradox of fiction by outlining a multi-level model of the emotion system at a coarse-grain level of analysis. The first part of the chapter will consider the ways in which we react to the actual objects and events that we encounter in the world, whilst the second part will consider the ways in which we react to the representations of objects and events that we encounter in the cinema. In both parts, the emotional process will be broken down into the input, induction, and response stages cited above. Throughout, the neurobiological accounts of LeDoux and Damasio will allow us to gain an understanding of the basic relationship between our perceptual, cognitive, and emotional systems on the one hand, and the role of the body on the other. The functional account exemplified by Fodor's account of the mind/brain, on the other hand, will allow us to clarify the precise nature of the information which is processed by, and passes between, each of these systems. In particular, the chapter will demonstrate how the first and third ways of seeing - namely, Fodorian modularity and central processing (regarding-as and seeing-as type I) - may relate to the emotion system.

3.2 REACTING TO THE WORLD

Having should we understand our reactions to the real world? Although the aim of the following discussion is to illustrate a multi-level model of the emotion system which applies to a variety of emotions, it will focus on the primary emotion of fear. Susan Feagin (1997, p.55) states that fear 'crop[s] up in aesthetic discussions with depressing regularity'. Despite this regularity, it seems that fear still provides us with the best place to start. A preliminary argument comes from philosophy and film theory: both Walton and Carroll set the agenda by focusing on our responses to horror in their discussions of the paradox of fiction. The decisive argument, however, comes from neuroscience: if we wish to outline a multi-level model which begins at a neurobiological level, then fear is really the only emotion on the table. (Throughout the discussion, the reader is asked to bear in mind the following question: Could an equivalent model have been constructed from the neuroscientific research on any other emotion?)

The predominance of fear lies in the fact that it is a 'relatively tractable emotion' which involves 'clearly defined stimuli and responses'.[3] The main research strategy is a procedure known as *fear conditioning* - based on the classical conditioning paradigm originally formulated by Ivan Pavlov (1927).[4] The first method for tracing the neural systems and pathways which 'underpin' fear involves selectively damaging a certain region of the subject's brain, and then ascertaining whether or not the lesion interferes with fear conditioning. The second method involves injecting a 'tracer' into a certain region of the subject's brain, frightening the subject, and then examining sections of the brain under a microscope. For ethical and practical reasons, this research cannot be conducted on humans; it must be conducted, therefore, on mammals such as rats which are believed to be closely enough related to humans - in evolutionary terms - to make illuminating comparisons. Although it is relatively easy to elicit and condition the emotion of fear in rats, the elicitation and conditioning of emotions such as anger, disgust, sadness and happiness - not to mention love, guilt, jealousy, and so forth - is an entirely different story.

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[3] Joseph LeDoux, 'Parallel Memories: Putting Emotions Back Into the Brain'. Interviewed by John Brockman at: http://www.edge.org/3rd_culture/ledoux.

[4] The story of Pavlov ringing a bell prior to feeding his dogs is well-known. At first, the presentation of the food (an *unconditioned stimulus*) prompted the dogs to salivate (an *unconditioned response*). After repeatedly pairing the bell with the food, the sound of the bell ringing became a *conditioned stimulus* and salivation a *conditioned response*.

At certain parts of the discussion, we will need to compare fear with another primary emotion in order to demonstrate potential differences in the input, induction, and response stages of the emotional process. Perhaps the closest emotion to fear is the primary emotion of disgust in the sense that both emotions are fundamentally related to survival and often occur in conjunction. Indeed, Carroll refers to horror as a 'compound emotion' comprising both of the emotions in question. A consideration of this compound emotion also brings us to a related conundrum which Carroll describes as the *paradox of horror*: why would anyone subject themselves to negative objects and events, and the negative emotions which accompany them?

(a) Shallow inputs: the role of emotional stimuli

Let us assume that an emotional episode begins with the 'perception' of some sort of object or event which has emotional significance for the subject. And let us begin with the simplest type of object or event. This brings us to the notion of an *emotional stimulus*. Throughout the thesis, the term 'stimulus' will be used to refer to a single 'sensory object' which has relatively strong emotional connotations. An emotional stimulus can be perceived via any sensory modality but we are primarily concerned, of course, with the visual and the auditory. Following the classical conditioning paradigm, an emotional stimulus can be either *unconditioned* or *conditioned*; that is, 'biologically prepared' during the course of human evolution or learnt during the course of an individual's lifetime. In this respect, LeDoux makes a distinction between *natural* and *learnt triggers*.

The first source of emotional stimuli is provided by the *situation* which confronts the person (see Figure 3.1). Following LeDoux's (1998) example from *The Emotional Brain*, imagine walking along a woodland path with a companion (pp.163-165, p.166). Suddenly, you catch a glimpse of a snake-like object - namely, 'a slender curved shape' - a few feet ahead. Many theorists propose that snakes - along with spiders - are natural triggers for fear; it is probable that both types of creature were encountered by our hunter-gatherer ancestors during the Pleistocene era and posed a relatively significant threat to their survival and well-being. It is plausible that there are a variety of natural triggers for fear (see Damasio, 1994, p.131). In the visual realm, potential candidates include looming objects, heights, blood, injuries, and facial expressions of fear. In the auditory realm, potential candidates include the sounds of growls and screams. (With regard to learnt triggers, Arne Öhman, 1993, has demonstrated that not all objects can become *conditioned* fear stimuli: for instance, snake fear is more likely than fear of either guns or electric sockets.)

Figure 3.1: Situational cue

The second source of emotional stimuli would be provided by the *person* themselves (see Figure 3.2). You direct both your eyes and ears towards your companion and perceive that their face, body, and voice are 'displaying' expressions of fear. Each of these expressions may operate as an emotional stimulus in its own right.

Figure 3.2: Personal cue

Similar remarks can be made about the emotion of disgust. According to Paul Rozen et al. (2000) snakes - and spiders - are also objects of revulsion; indeed, Davey (1993) suggests that our aversion to such creatures stems more from disgust than fear. Once again, there is a variety of natural disgust triggers. In the visual realm, possible examples include bodily excretions, mutilated and rotting flesh, and corpses. In the auditory realm, possible examples include the sounds which accompany the visual stimuli described: for example, the sound of a person vomiting.

(i) Sensory information from sensory (thalamic) systems

How would we respond in such a situation (see Figure 3.3)? LeDoux describes the first route to fear as the *low road*. Transducers at the retina would send relatively processed information to the visual thalamus (or LGN) - the subcortical structure which can be regarded as an evolutionarily 'old' part of our visual system. The thalamus would process the crude *stimulus features* of the snake-like object: for example, the slender and curved shape. The resulting *sensory information* would be sent to the amygdala via a direct pathway which bypasses the neocortex. Subsequently, the amygdala would initiate certain physiological and behavioural responses, in order to prepare our body for adaptive 'fight-or-flight' action.

(ii) Perceptual information from perceptual (cortical) systems

The second route to fear is described as the *high road*. In the meantime, the visual thalamus would 'relay' the same information to the visual cortex - the neocortical structure which can be regarded as an evolutionarily 'new' part of our visual system. (To recap, the thalamus is described as a 'gateway' to the neocortex and a 'relay station' between the transducers and the neocortex.) The visual cortex would process a more 'complete' and 'detailed' *object representation* of the snake-like object: for example, the specific colours and textures. The resulting *perceptual information* would be sent to the amygdala, which, in turn, would modify its activity accordingly. If the snake-like object was identified as an actual snake, then the amygdala would continue to initiate appropriate fear-type responses. If, on the other hand, the snake-like object was identified as a harmless stick, then the amygdala would cease to initiate the responses in question.

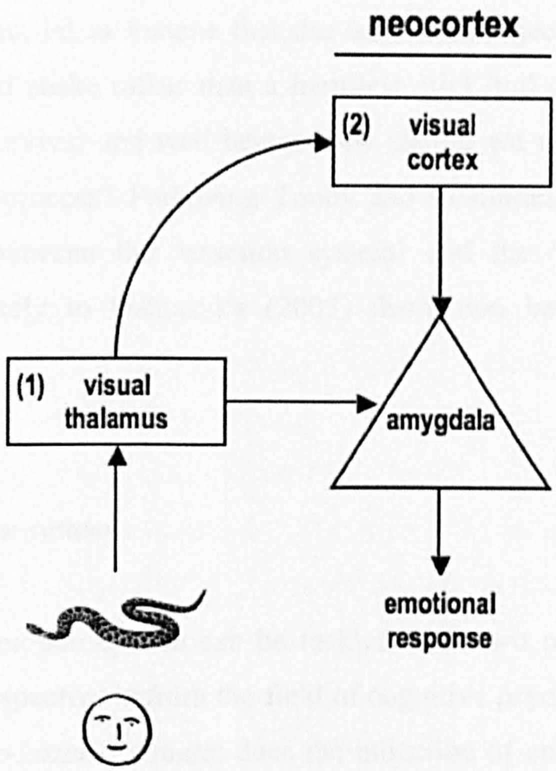
Why are there two routes to fear? LeDoux offers an evolutionary explanation which builds on the principle of *conservatism*. Retaining a fast-acting circuit which sacrifices accuracy for speed has survival advantage: LeDoux (1993, p.112) suggests that the circuit in question effectively serves as an 'early-warning system'. What is more, 'false positives' are less costly than 'false negatives': LeDoux (1998, p.165) states that 'the cost of treating a stick as a snake is less, in the long run, than the cost of treating a snake as a stick'.

* * *

How does LeDoux's neurobiological account square with Fodor's functional one (see Table 3.3)? Although Fodor refers to 'transducers' and the 'visual system' - corresponding to the retina and 'fixed neural architecture' respectively - he does not refer to anything resembling the thalamus from either a functional or a neuroanatomical perspective. LeDoux's account suggests, however, that rather than making a two-fold distinction between transducers and the visual system, we should make a three-fold distinction between transducers, and the 'early' and 'later' visual systems - corresponding to the retina, thalamus, and cortex respectively. Recall that Fodor suggests that the visual system produces basic categorizations of the objects in our environment as shallow outputs: the object representations "snake" and "stick" would be examples of such categorizations. LeDoux's account suggests that the early visual system produces outputs which are even 'shallower' than basic categorizations: namely, information regarding the crude stimulus features of an object. (When describing the process from the perspective of the emotion system, these shallow outputs should be classified as *shallow inputs.*) If anything, however, these qualifications lend weight to Fodor's argument about the informational encapsulation (etc.) of the visual system (and they do not affect his arguments about the nature of the information being fed to central systems).[5]

[5] A similar account could be given for the auditory system in terms of both LeDoux's neurobiological account and Fodor's functional one. Imagine, for instance, suddenly hearing a loud and indiscriminate human sound. In this case, the auditory thalamus would process the crude stimulus features of the sound (in terms of volume and tone). The auditory cortex, on the other hand, would create a detailed object representation, identifying the sound as either an ominous scream or a harmless sneeze.

Figure 3.3:The emotion system: real world encounters



Adapted from Figure 6.13 ('The Low and the High Roads to the Amygdala') from LeDoux (1998), p.164, and Figure 69.2 from LeDoux (1995), p.1053.

Table 3.3: Inputs to the emotion system (amygdala)

	neurobiological account (re. LeDoux): origin of input	**functional account (re. Fodor): content of input**
1	sensory (thalamic) systems *	shallow: e.g. "snake" (stimulus features)
2	perceptual (cortical) systems	shallow: e.g. "stick" (object representation)

* Not predicted by Fodorian account.

(b) Induction

For the sake of argument, let us assume that the snake-like object on the woodland path turns out to be an actual snake rather than a harmless stick and that it therefore poses a genuine threat to our survival and well-being. How should we understand the induction stage of the emotional process? Following Tooby and Cosmides (2001), let us make a pragmatic distinction between the 'emotion system' and the 'action system', which corresponds approximately to Damasio's (2003) distinction between 'triggering' and 'execution'.

(i) Activating the emotion system

The activation of the emotion system can be tackled from two related perspectives (see Table 3.4). The first perspective is from the field of cognitive psychology and has come to be known as the *Zajonc-Lazarus debate*: does the induction of emotion depend primarily on cognitive processing - as Richard Lazarus (1982, 1984) proposes - or does it depend on affective processing - as Robert Zajonc (1980, 1984) argues? The second perspective is provided by the third proposition of the paradox of fiction: does the induction of emotion make reference to existence beliefs - as Radford (1975) and co. assume - or does it operate independently of existence beliefs - as some recent theorists have speculated?

□ *Direct activation: affective processing*

Following Radford, Kendall Walton (1978, p.6) takes it to be 'a principle of common sense' that fear requires existence beliefs. In contrast, Carroll (1990, p.78) acknowledges that the possibility of fear *not* requiring existence beliefs 'remains at least an open question'. He does not, however, explore this question in any depth. In a later (1999) article, however, Carroll proposes a cognitive theory of the 'garden-variety' emotions: according to this theory, emotions require cognitive states as 'causes' and body states as 'effects'. By way of support, he cites the following example: 'I cognize the scorpion next to my hand under [the category of] the harmful, that cognition causes my blood to freeze, and the overall state is fear.' (p.27) (Presumably, the cognition in question would make reference to the belief that the scorpion exists.) Carroll is correct in assuming that some sort of 'appraisal' must intervene between the perception of the scorpion (as an emotional stimulus) and the elicitation of fear (as an emotional response). The neurobiological (and evolutionary) account suggests, however, that he is incorrect in assuming that this appraisal is necessarily cognitive in nature and necessarily involves an assessment of existence.

Following Zajonc's terminology, the *affective appraisal* of the threat posed by either the snake or the scorpion would be mediated by the subcortex: the evolutionarily old, or 'reptilian', part of the brain. In particular, LeDoux singles out an almond-shaped area of the limbic system called the amygdala. In light of this, at least two arguments can be made for the irrelevance of existence beliefs.

(1) The default mode of naïve realism. If the amygdala evolved - both phylo- and ontogenetically - to cope with the existing world, then why do we need to postulate the 'entities' of existence beliefs at all? Why not simply say that the default mode of the amygdala is appraising *existing* objects and events: for instance, actual snakes and actual scorpions? According to this view, *non*-existence beliefs are required to over-ride the default mode in question. Significantly, LeDoux (1998, p.165) proposes that: 'The cortex's job is to prevent the inappropriate response rather than to produce the appropriate one.'

(2) The property of informational encapsulation. As a subcortical structure, the operations of the amygdala are inaccessible to - that is, 'below' - consciousness. LeDoux (1993, p.112) states that the amygdala is 'blind to the true nature of stimuli'; a fact which implies that it is at least partially encapsulated with respect to existence beliefs. Similarly, Damasio (1999, 2003) stresses the subcortical, subconscious nature of the induction process: according to his lock and key analogy, signals resulting from the perceptual processing of the emotional stimulus (the so-called 'key') activate 'emotion induction sites' which are 'preset' to respond to that particular class of stimulus (the 'lock'). (For Griffiths, 1997, the fact that an 'affect program' such as fear is informationally encapsulated distinguishes it - as a natural kind - from higher cognitive emotions.)

It is intriguing that certain emotions seem to be more susceptible to the paradox of fiction than others. In contrast to fear, Carroll assumes that the primary emotion of disgust does not require existence beliefs. Why is this so? The reason might be as follows: Although fear may be partly *stimulus-driven* (or *sensory-dependent*), disgust seems to be almost *entirely* so: indeed, being disgusted by certain sights and sounds is such a commonplace phenomenon, perhaps, that we take it for granted. Presumably, the snake and the scorpion - as emotional stimuli qua 'sensory objects' - would be capable of activating those 'disgust' induction sites which are 'preset' to that particular class of creature: these induction sites may be located in subcortical structures such as the *basal ganglia* (see Rozin et al., 2000, pp.649-650).

□ *Indirect activation: cognitive processing*

An advocate of Carroll's cognitive theory of emotions might make two objections. The first objection concerns the possibility of primary emotions (or 'affect programs') being elaborated by what could be described as 'higher cognitive processing'. It seems reasonable to propose that once the shock of seeing the snake or the scorpion had subsided, our fearful response would be influenced by the cognition that the snake or the scorpion is poisonous, that a snake bite or a scorpion sting would be fatal, that another hiker had recently fallen victim on the same trail, that we are many miles from the nearest hospital, and so forth.

Following Lazarus's terminology, the *cognitive appraisal* of these implications would be mediated by the neocortex: the evolutionarily new, or 'human', part of the brain. In particular, LeDoux (1998, p.177) makes the following admission: 'We don't really fully understand how the human brain sizes up a situation ... but these activities are unquestionably amongst the most sophisticated cognitive functions. ... From what we currently know, it seems likely that regions like the prefrontal cortex may be involved.' Significantly, cognitive (cortical) processing is potentially accessible to - that is, 'within' - consciousness; the issue of whether or not it is dependent on existence beliefs will be discussed in Chapter 4 (see section 4.3). For the time being, it should be noted that the results of cognitive (cortical) processing would be fed back to the *same* subcortical region described above - namely, the amygdala. (Robert Roberts, 2003, Ch. 1 notes that this type of scenario challenges Griffith's claim that affect programs are entirely encapsulated.)

The second objection concerns secondary emotions, or what Griffiths describes as 'higher cognitive emotions'. Recall Radford's example of the man who tells us a 'harrowing story' about his sister. Similarly, Damasio (1994, pp.134-139) asks us to imagine 'being told of the unexpected death of a person who worked closely with you'.[6] In

[6] Damasio actually divides the process - from hearing the news to responding emotionally - into three stages. The first stage involves the conscious formation of appropriate 'mental images' in the sensory cortices of the brain. The second stage involves the nonconscious evaluation of the emotional implications of the situation

this case, it seems reasonable to propose that our 'harrowing' response to such news would be influenced by the cognition that the person had died at a relatively young age, that they had left behind a spouse and children, that we would never have the chance to work and socialise with that person again, and so forth. According to Damasio, the cognitive appraisal of such implications would be mediated by the prefrontal cortex. Once again, however, the results of such cognitive (cortical) processing would be fed back to subcortical regions such as the amygdala, which, in turn, would initiate appropriate physiological and behavioural responses. In other words, the machinery for the expression of primary emotions would be *co-opted* for the expression of the secondary emotions. (In a related fashion, the emotion of *moral disgust* would require an element of cognitive appraisal: for instance, the assessment that some social code had been contravened. It is plausible, however, that it would be expressed by the same machinery which underlies our disgust at the sight of the snake or scorpion: namely, the basal ganglia.)

Table 3.4: Activating the emotion system

	neurobiological perspective	**functional perspective**	**reliance on existence beliefs?**
(1) direct activation **- affective processing (see Zajonc)**	subcortex : amygdala, basal ganglia ('mammalian')	primary emotions (affect programs)	no: partial encapsulation / lock-and-key analogy
(2) indirect activation **- cognitive processing (see Lazarus)**	neocortex: prefrontal cortex ('human')	- primary emotions (elaborated by higher cognition) - secondary emotions (higher cognitive emotions)	answer: see Chapter 4 (section 4.3)

(ii) Engaging the action system

To return to our encounter with the snake, the activation of the emotion system would be followed by the engagement of the action system (see Table 3.5). In order to fully understand the nature of this engagement, it will be necessary to refer to the first two components of our (subsequent) emotional response, and the two branches of the

by the prefrontal cortex. The third and final stage involves the initiation of appropriate physiological and behavioural responses by the amygdala.

peripheral nervous system respectively (cf. Grodal, 1997, pp.42-45). (This two-fold distinction will be of significance when we come to consider the dual nature of film viewing.) The *physiological component* of our emotional response would be mediated by the *autonomic nervous system* (ANS) which is largely beyond voluntary control. The ANS transports signals from the CNS to the 'viscera': namely, the internal organs (and glands) which are composed of smooth muscle. If our emotion was one of fear, it would be associated with the *sympathetic division* of the ANS which is primarily concerned with the expenditure of energy: examples of sympathetic responses include increases in heart rate, respiration, and perspiration, and the directing of blood to the skeletal muscles to aid physical exertion. (In addition, the adrenal gland is activated, resulting in the release of adrenaline into the bloodstream.) If our emotion was one of disgust, on the other hand, it would be associated with the *parasympathetic division* of the ANS which is primarily concerned with the restoration of energy: examples of parasympathetic responses include decreases in heart rate and the directing of blood to the stomach to aid digestion.

In contrast, the *behavioural component* of our emotional response would be mediated by the *somatic nervous system* (SNS) which is largely within voluntary control. The SNS transports signals from the CNS to the 'soma': namely, the striated muscles which are attached to the skeleton. In the case of fear, the main *instrumental behaviour* would be the flight response, whilst an example of an *expressive behaviour* would be the corresponding facial expression. In the case of disgust, on the other hand, the behavioural components would be less certain: Rozin et al. (2000, p.638) state that '[d]isgust is manifested as a distancing from some object, event, or situation, and can be characterized as a rejection.' Given, however, that it is not clear whether this 'distancing' or 'rejection' involves an *active* withdrawal from the object or the *passive* disinclination to approach the object, the most obvious behaviour - either instrumental or expressive - might be the corresponding facial expression alone. Indeed, the fact that the facial movements in question either 'discourage entry into the body' or 'encourage discharge' suggests that the expression *is* instrumental. In conclusion, invisible and involuntary physiology provides support for visible and voluntary behaviour; although the relevance of the physiological and behavioural components is more obvious for fear than disgust, the key point is that fear is a 'sympathetic' (active) emotion, whereas disgust is a 'parasympathetic' (passive) one.

Table 3.5: Engaging the action system

	fear	disgust
(1) physiological component **-autonomic** **- involuntary, invisible**	sympathetic responses: e.g., increases in heart rate, respiration, and perspiration; release of adrenaline	parasympathetic responses: e.g., decreases in heart rate, etc.
(2) behavioural component **- somatic** **- voluntary, visible**	instrumental response: flight expressive response: facial expression	instrumental / expressive response: facial expression

(c) Responses, feedback, and interpretation

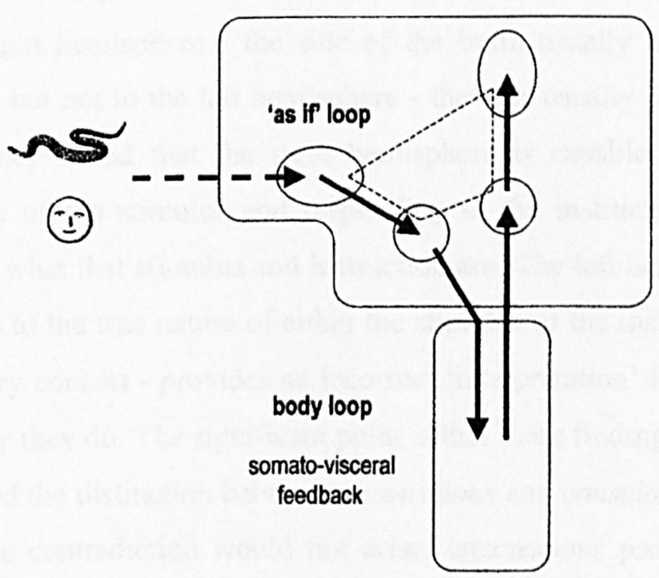
Remember that the snake on the woodland path poses a genuine threat to our survival and well-being. How should we understand the response stage of the emotional process? And how should we understand the role of the physiological, behavioural, and subjective components? These questions can be answered by addressing two well-known theories of emotion.

(i) The James-Lange theory of emotion and the role of somato-visceral feedback

According to the *James-Lange theory of emotion*, our experience of a particular emotion is the result of us cognitively 'perceiving' that our body is in a certain physiological and behavioural state: to cite a much used example, we do not run because we feel afraid; rather, we feel afraid because we run. Is bodily feedback necessary and sufficient for emotional experience? Different accounts give different answers - usually, on the inconclusive or negative side. Paul Ekman and colleagues claim that there are distinct ANS patterns for each of the primary emotions of fear, disgust, anger, and sadness (see Ekman, Levenson, and Friesen, 1983; Levenson, Ekman, and Friesen, 1990). LeDoux (1998, pp.291-296) argues that we can justify the claim that bodily feedback has sufficient 'speed and specificity' to generate emotional experience, as long as we refer to both *somatic* and *visceral* feedback, and consider the overall context in which both types of feedback occur.

The James-Lange theory can be both updated and given a (neuro)biological grounding by considering Damasio's (1994) account of somato-visceral feedback (see Figure 3.4). The first cycle is described as the *body loop*. Interoceptive information regarding our visceral body states and proprioceptive information regarding our somatic body states would be signalled to somatosensory structures in the central nervous system, from the brain stem upwards. Once this information reached the somatosensory structures, it might be 'attended' and 'made conscious'. This might contribute to the subjective component of emotion: namely, the conscious, qualitative experience which we commonly associate with the terms 'fear' and 'disgust'. The second cycle is described as the *'as if' loop*. On certain occasions, the body may be bypassed and the somatosensory structures activated directly by the prefrontal cortex, thereby giving rise to an 'as if' emotional experience.[7] According to Damasio's *somatic-marker hypothesis*, objects and events become associated with - and subsequently 'marked' by - certain somatic states; these somatic markers function as 'biasing devices' in the cognitive process of decision-making. (As we will see, the body loop plays a significant role in the case of film viewing: enabling us to understand the impact of a variety of bodily prompts - see Chapters 4 and 5.)

Figure 3.4: The role of somato-visceral feedback



Based on Figure 7.6 from Damasio (1994), p.156.

[7] The *Cannon-Bard theory of emotion* claims that activity within the brain is sufficient to produce an emotional state.

(ii) The Schachter-Singer theory of emotion and the role of conscious interpretation

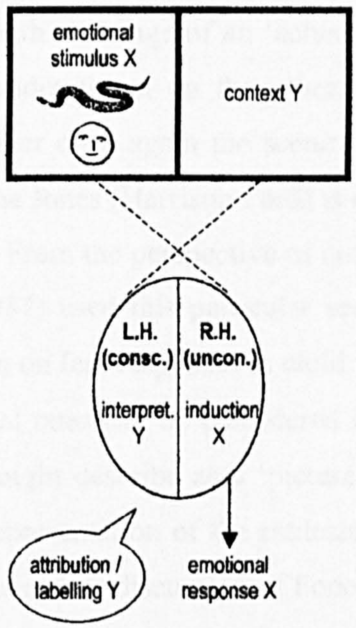
The *Schachter-Singer theory of emotion* adds the role of cognitive attribution and cognitive labelling.[8] In a well-known experiment from 1962, subjects were injected with a form of adrenalin. Those subjects who were informed of the true side effects of their injections had an adequate causal explanation for the way they were feeling and remained calm. Those subjects who were not informed of the true side effects, however, performed a cognitive search for information which would provide them with the required explanation. According to *attribution theory*, social perceivers tend to use the most salient environmental cues to arrive at causal explanations for their own emotional responses; in certain circumstances, this tendency may lead to *mis*attributions (see Fiske and Taylor, 1991, p.23). In light of this, those subjects who were placed in the presence of an angry person causally misattributed and cognitively labelled their ambiguous feelings as 'anger', whereas those who were placed in the presence of a euphoric person causally misattributed and cognitively labelled their feelings as 'euphoria'.

The Schachter-Singer theory can be both updated and given a neurobiological grounding by considering some of the earlier research which LeDoux conducted with Michael Gazzaniga on split-brain subjects (see Figure 3.5). Gazzaniga and LeDoux (1978; Gazzaniga, 1992) presented either an emotional stimulus or an instruction to act to the subject's right hemisphere - the side of the brain usually associated with visuo-spatial capacities - but not to the left hemisphere - the side usually associated with language and thought. They found that the right hemisphere is capable of assessing the emotional significance of the stimulus and responding to the instruction to act, but incapable of verbalising what that stimulus and instruction are. The left hemisphere, on the other hand, is oblivious to the true nature of either the stimulus or the instruction but - on the basis of contradictory context - provides an incorrect 'interpretation' for why the subject feels and acts the way they do. The significant point is that these findings can be extended to normal subjects, and the distinction between *unconscious* and *conscious processing*. In the case of the snake, a contradiction would not arise: unconscious processing would result in the induction of fear, whilst conscious processing would interpret the situation correctly, causally attributing our emotional response to the snake and cognitively labelling it as fear.

[8] Although somato-visceral feedback may be sufficiently differentiated to specify primary emotions in the real world, we need to appeal to causal attribution and cognitive labelling in order to account for primary emotions in the cinema, and secondary emotions in both the world *and* the cinema.

(Here, we have another two-fold distinction which will play a significant role when we come to consider the dual nature of film viewing.)

Figure 3.5: The role of conscious interpretation



3.3 REACTING TO THE CINEMA

(a) Shallow inputs ('regarding-as')

Having described one of the ways in which we react to an emotional episode in the real world, how should we understand our reactions to an equivalent episode depicted by the cinema? Although a number of film theorists have referred to LeDoux's neurobiological account of the emotion system, they tend to take his two-fold distinction between the 'low' and 'high roads' at face value, assuming that it is adequate to explain the dual nature of film viewing as its stands.[9] In order to ascertain whether or not this is really the case, we need to understand the Fodorian nature of the shallow inputs feeding into the emotion system and the true role of Wittgenstein's notion of 'regarding-as' in relation to the emotions.

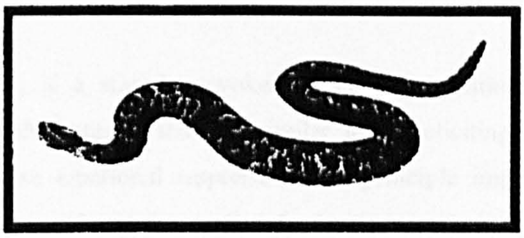
[9] See Cynthia Freeland (1999), Patrick Colm Hogan (2003), and Greg M. Smith (1999, 2003).

(i) Sensory / perceptual information: representation versus referent

The distinction between representation and referent can be addressed by adapting LeDoux's story about the snake on the woodland path. Imagine that you leave the woodland in question and step into your local cinema. And imagine that the film that you choose to watch presents you with an image of an 'actual' snake on the one hand, and an image of an 'actual' person under threat on the other. To take an example from the adventure (action) genre, consider once again the scene from Spielberg's *Raiders of the Lost Ark* (1981) in which Indiana Jones (Harrison Ford) is confronted by a venomous rattle snake (section 2.3; Frame 2.8). From the perspective of communications research, Barbara Wilson and Joanne Cantor (1987) used this particular scene to test the effects of visual exposure and verbal explanation on fear responses in child viewers.

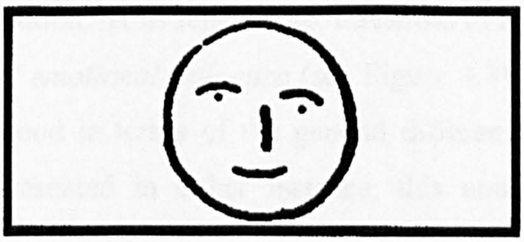
The impact of situational cues can be considered by taking a look at a cinematic version of what Wittgenstein might describe as a 'picture-snake' (see Figure 3.6). In the *Raiders* scene, the cinematic representation of the rattlesnake entails photographic, sonic, and behavioural realism. Following our discussion of Fodorian modularity (and regarding-as, type I), it is plausible that the 'low road' - the 'fast-acting' thalamic-amygdala circuit - would 'warn' our fear system (amygdala) that we are in the presence of a snake-like object, and our fear system would, in turn, initiate fear-type responses. What, though, would the 'high road' - the 'slow-acting' cortical-amygdala circuit - 'tell' our fear system? What we really want to say here is that the cinematic representation would continue to resemble an actual snake in significant respects *after* the cortical processing had been completed; after all, that is how it appears to us as conscious observers. Perceptually speaking, the only thing clearly 'missing' from the image would be the 'depth cue' provided by binocular disparity (and this is more than compensated for by motion parallax). In conclusion, then, it is plausible that the 'high road' in a real-world encounter with a 'possible' snake is only the 'middle road' in a cinematic encounter with an 'actual' snake.

Figure 3.6: Cinematic 'picture-snake'



The impact of personal cues can be considered by taking another look at a Wittgenstein's 'picture-face' (see Figure 3.7). In the *Raiders* scene, the cinematic representation of Jones's face entails photographic, sonic, and behavioural realism. (Later in the scene, Jones is re-united with the heroine of the film, played by Karen Allen. In order to control the variables, Wilson and Cantor edited out Allen's facial expressions of fear.) In this particular case, it is uncertain whether or not the 'low road' would play a significant role: for example, would the crude stimulus features of a face distinguish between an expression of either fear or disgust on the one hand, and an expression of, say, happiness on the other? Whatever the answer to this question, however, it seems plausible that the high road would inform our fear system that we are in the presence of an actual person in a state of fear. Signals from the later stages of visual processing - more specifically, from the facial area (TE) in or around the inferotemporal cortex - would activate those induction sites in the amygdala which are 'preset' to respond to that particular class of stimulus. In conclusion, then, it is plausible that the 'high road' in a real-world encounter with an actual person is only the 'middle road' in a cinematic encounter with a character.

Figure 3.7: Cinematic 'picture-face'



In a related fashion, Cantor (2002) investigates fright responses to mass media presentations and addresses the paradox of fiction (although she does not use this particular phrase). Following the classical conditioning paradigm, Cantor proposes a solution to the paradox in terms of 'stimulus generalization':

> In conditioning terms, if a stimulus evokes either an unconditioned or conditioned emotional response, other stimuli that are similar to the eliciting stimulus will evoke similar, but less intense emotional responses. This principle implies that, because of similarities between the real and the mediated stimulus, a stimulus that would evoke a fright response if experienced firsthand will evoke a similar, but less intense response when encountered via the mass media. (p.291)

Cantor implies that mediated stimuli elicit less intense responses than their real-world counterparts because they do not sufficiently resemble the original stimuli.[10] One could argue, however, that mediated stimuli are at least as strong as their real-world counterparts. Indeed, films often present what biologists describe as *super-stimuli* (see Evans, 2001, p.89): in a film such as Luis Llosa's *Anaconda* (1997), for instance, the snake is larger than life in actual terms (whilst the close-ups of the faces projected onto the screen are larger than life in visual terms). Although Cantor only offers stimulus generalization as a 'preliminary explanation' for fright responses to mass media, we need to appeal to additional routes or 'levels' of discrimination in order to account for our emotional relationship to high resolution, moving images - i.e., stimuli that bear more than a transient resemblance to their 'referents'.

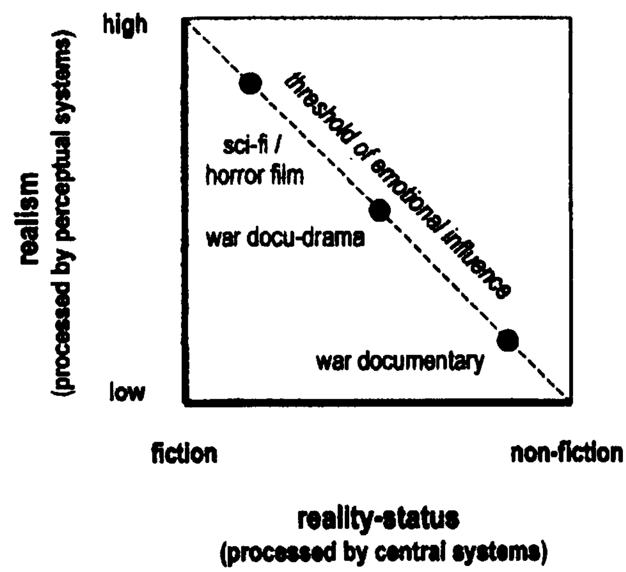
(ii) Sensory / perceptual information: fiction versus non-fiction

The distinction between fiction and non-fiction can be addressed by returning to the threshold model of diegetic influence. Considering that the focus of our investigation has turned to the subject of emotion, let us replace the 'threshold of diegetic influence' with the more specific *threshold of emotional influence* (see Figure 3.8). The fiction / non-fiction distinction can be understood in terms of the general differences between the sensory / perceptual information presented in either instance; this understanding will require a

[10] Cantor lists three categories of objects and events which tend to elicit fear in exposure to both the real world and film: (1) dangers and injuries; (2) distortions of natural forms; and (3) the experience of endangerment and fear by others (pp.291-293). All of these categories will be touched upon in the following discussion.

further consideration of the factor of realism - and the sub-factor of perceptual access - along with a new consideration of the various constraints in operation. Having discussed the adventure (action) genre, let us consider two further genres which also present extreme situations not usually encountered in the modern (western) world and post-industrial societies (Lenski, 1970).

Figure 3.8: The threshold model of emotional influence



(1) Low reality-status. Starting at the 'low end' of the reality-status continuum, the most obvious examples of fiction films designed to elicit the emotions of fear and disgust are provided by the *horror / science fiction genre.* Walton (1978) cites the example of Charles watching a film featuring a 'terrible Green Slime' (as a non-existent or impossible being). In a related fashion, Carroll (1990) discusses the viewer's response to the 'monster', where the monster, like the snake in the above example, is a 'heuristic device' standing in for any horrific object. Significantly, Carroll describes the monster as having the properties of being 'threatening' and 'impure' - corresponding to the emotions of fear and disgust respectively - and suggests that these two properties are achieved through a violation of cultural categories. How might this violation take place? According to Carroll's *fusion model*, the monster in Ridley Scott's *Alien* (1979) is an unnatural 'fusion' of the cultural categories of 'human', 'insect', 'reptile', and so forth (see Frame 3.1). To describe this model in the terms of the current discussion, the alien can be regarded as a 'fusion' of the types of (real-world) fear and disgust 'triggers' described previously (cf.

Carroll, ibid., p.166). (Indeed, the alien as a whole can be regarded as a 'super-stimulus' for the emotions in question.) What about the character who is both threatened and repulsed by the monster? In a strict sense, the character of Ripley (played by Sigourney Weaver) is not an object of either fear or disgust (see Frame 3.2). Nevertheless, her facial, bodily, and vocal expressions of emotion may operate as fear (and disgust) stimuli by association.

Frames 3.1 and 3.2: Low reality-status (science fiction / horror film): *Alien* (1979)

In the case of horror films, there has been a 'general trend' towards *realism*, or more precisely, perhaps, a 'general trend' towards *salience*. This trend has been facilitated by a number of *positive constraints* which can be divided into three basic groups (see Table 3.6). First, the *film-maker* introduces various aesthetic and technological constraints into the equation. With respect to the aesthetic, one could argue that there has been an artistic move towards producing more realistic / salient depictions of the world; as noted previously, for instance, the domain of film acting may have been influenced by the standards of the documentary. With respect to the technological, on the other hand, an improvement in cameras, film-stock, and special effects - especially CGI and prosthetics - has increased the realism / salience of the monster's appearance (especially the textures of fleshy body parts). Second, the *film viewer* introduces various cognitive and emotional constraints: for instance, viewers may expect to see more realistic / salient depictions (a 'cold', cognitive factor), and, for a variety of reasons, they may be motivated to see such depictions (a 'hot', emotional factor). As we will see, the desire to subject oneself to particularly graphic or horrific subject-matter leads to the paradox of horror. Third and finally, the *film adjudicator* introduces various moral and legal constraints: it seems reasonable to say that a relaxation of socio-cultural attitudes regarding the depiction of horrific subject-matter (partly a moral issue) has resulted in a gradual relaxation of the laws of film censorship (a legal issue). In the early days of cinema, when the monster may not have been particularly convincing, the main route to fear - and, to a lesser extent, disgust - may have been (narrative-based) concern for the character (see Carroll on the role of sympathy). In the modern day, however, both the monster and the character (as spectacles) may 'satisfy the input conditions' of the viewer's fear and disgust systems.

Table 3.6: The realism / salience of shallow inputs: positive constraints on fiction film-maker

	positive constraints	description
(1) film-making	aesthetic	general trend towards realism (behavioural, situational)
	technological	improvement of cameras, film-stock, special effects, etc.
(2) film viewing	cognitive	change of viewing expectations
	emotional	change of viewing motivations (see paradox of horror)
(3) film adjudication	moral	relaxation of socio-cultural attitudes
	legal	relaxation of censorship laws

N.B. This scheme makes a number of basic assumptions: (1) the film-maker is not subject to any economic constraints (i.e., they have access to adequate financial resources); (2) the film-viewer is 'prototypical' (Anglo-American); and (3) the film adjudicator adopts an Anglo-American perspective.

(2) Medium reality-status. The 'middle' and 'high end' of the reality-status continuum can be tackled by considering a subject not discussed by either Walton or Carroll: the most obvious examples of docudramas and documentaries which elicit the emotions of fear and disgust are provided by the *war genre.* One of the most recent and well-known examples of a war docudrama is Steven Spielberg's *Saving Private Ryan* (1998): the opening sequence recreates the D-Day landings, depicting the first wave of American soldiers on Omaha Beach and presenting an array of fear and disgust stimuli (see Frame 3.3).[11] With respect to the situational component, the most obvious fear stimuli are the various dangers faced by the (main) characters: examples include confrontations with the enemy, and exposure to flying bullets and hazardous terrain. With respect to the

[11] See Barratt (1999) for a more detailed analysis of the emotional power of this particular sequence which employs the same (cognitive) approach.

character-based component, on the other hand, a notable feature of the sequence is the sight and sound of wounded soldiers. In a review of the film, Richard Williams (1998) describes a particular shot as follows: 'A man is lying next to his own evacuated intestines, crying for death.' Although in a strict sense the object of our emotion is not the soldier himself but the environment which surrounds him, the soldier's facial, bodily, and vocal expressions of distress may operate as fear stimuli, whilst his physical injuries constitute one of the main sources of disgust. Indeed, the 'redness' of blood and the 'fleshiness' of internal organs are further possible examples of super-stimuli employed by the film-maker. In the case of war films, there has also been a 'general trend' towards both realism (proper) *and* salience; it is probable that this trend has been facilitated by the same set of positive constraints described above. In particular, an improvement in cameras and film stock has facilitated filming the depicted environment from a position which could be occupied by a soldier: positioning the camera at eye-level and in proximity to the action results in a greater approximation of the soldier's (perceptual) experience. Similarly, an improvement in special effects - especially CGI and prosthetics - has increased the realism (salience) of the depictions of physical injuries.

Frame 3.3: Medium reality-status (war film / docudrama): *Saving Private Ryan* (1998)

(3) High reality-status. A consideration of the 'high end' of the reality-status continuum leads us to the category of war documentaries. In this particular case, the level of realism / salience is limited by a number of *negative constraints* which can be divided into two basic groups (see Table 3.7). To set the scene, the war photographer Robert Capa (1947) famously stated: "If your pictures aren't good enough, you're not close enough." Capa's reasoning was that proximity to the action increases the realism / salience of emotional stimuli. This ideal is tempered, however, by a group of *practical constraints*.

First, the documentary film-maker must balance the quality of their photographs with their own personal safety. With respect to World War II, for instance, Spielberg's *Saving Private Ryan* was partly inspired by John Huston's *The Battle of San Pietro* (1944): Huston follows the soldiers with 'whip-pan' camera movements (see Frame 3.4). Similarly, with respect to the Vietnam War, the films of Coppola (1979), Stone (1986), and Kubrick (1987) may have been influenced by Pierre Schoendorffer's *The Anderson Platoon* (1966): Schoendorffer follows the American soldiers through the Vietnamese forests, the lens occasionally pushing against the blades of grass. Although both Huston and Schoendorffer got pretty close to the action - too close for their own comfort, no doubt - they didn't get *that* close; that is, not close enough to achieve the emotional impact to which Capa was alluding.

Frame 3.4: High reality-status (war documentary): *The Battle of San Pietro* (1944)

Second, it is probable that technology will continue to improve, resulting in smaller and lighter cameras, capable of producing higher quality pictures in a variety of lighting conditions. It is improbable, however, that the documentary film-maker who films actual people and events in 'real time' (using what could be described as a 'general-purpose' camera) will ever be able to compete with the fiction film-maker who can say 'cut!', take stock of the situation, choose a particular camera lens, and adjust the lighting (thereby benefiting from 'special-purpose' equipment). Third and fourth, the fiction film-maker can treat the camera as an 'ideally placed' and 'invisible' witness. With respect to ideal placement, for instance, the camera can be placed in a series of 'impossible' positions: given that two objects cannot occupy the same space at the same time, filming a POV shot from the position of the character's head - or a long shot from the position of the 'fourth wall' - requires removing the offending object and filming the action out of sequence. For the documentary film-maker, however, the spatio-temporal contradiction in question is not a problem awaiting either an aesthetic or a technological breakthrough; the physical aspect would require a world with different physical laws, whilst the logical aspect would be the same in all possible worlds. (Similar remarks could be made about the notion of 'invisibility'.)

According to the novelist John Steinbeck (1954), Robert Capa knew that 'you cannot photograph war because it is largely an emotion. But he did photograph that emotion, by shooting beside it. He could show the horror of a whole people in the face of a child.' Steinbeck's reasoning was that proximity to, say, a child increases the realism / salience of their facial expressions of emotion. This ideal is tempered, however, by a group of *ethical constraints*. The documentary film-maker must consider various moral and legal issues with respect to the needs and rights of the both the subject and the viewer. The positive need for communication on the one hand, must be balanced with the negative consequences of being intrusive and gratuitous / voyeuristic on the other; in the majority of circumstances, a person in distress can be filmed for communicative purposes, but not for purposes of emotional contagion. As we will see, some theorists suggest that there are rules governing the display of facial expressions; similarly, there are rules governing both the filming and the viewing of such displays.

Table 3.7: The realism / salience of shallow inputs: negative constraints on documentary film-maker

	negative constraints	description
(1) practical	personal	photographic quality vs. safety
	technological	'general-purpose' vs. 'special-purpose' cameras, etc.
	physical	physical impossibility of camera invisibility / ideal placement
	logical	logical impossibility of camera invisibility / ideal placement
(2) ethical	moral (re. subject)	obligations towards subject: communication vs. intrusiveness
	moral (re. viewer)	obligations towards viewer: communication vs. gratuitousness
	legal (re. subject)	laws regarding subject: communication vs. illegality
	legal (re. viewer)	laws regarding viewer: communication vs. illegality

(b) Deep inputs ('seeing-as')

If the 'high road' in a real-world encounter with an object or event is only the 'middle road' in a cinematic encounter with that object or event, then how should we go about finding the *real* high road? Because LeDoux is explicitly concerned with our emotional relationship to the real world - and because he does not have reason to refer to Fodor's modularity thesis in this particular context - he does not realise that his two-fold distinction between the 'low' and 'high roads' may not be capable of accounting for the unusual case of film viewing. At this point, then, we need to refer to another model described by LeDoux, though not in relation to the story about the snake: the model of the amygdala as 'a hub in the wheel of fear' describes two additional routes, or levels, of processing (see Figure 3.9). A consideration of these routes will allow us to understand the nature of the deep inputs feeding into the emotion system and the true role of Wittgenstein's notion of 'seeing-as' in relation to the emotions.

(i) Contextual information from central (hippocampal) systems

The first potential candidate for the 'high road' is the hippocampal-amygdala circuit. As noted previously, the hippocampal formation is located in the 'limbic system' - the part of the subcortex which is believed to be of mammalian origin. Contrary to the problematic 'limbic system theory', the hippocampus may play a role in central processing. Given that the hippocampus receives information from different sensory modalities, LeDoux proposes that it processes *contextual information* which may influence the activity of the amygdala accordingly. More specifically, the hippocampus is thought to play a role in the processing of *conjunctive representations*: whereas the visual (cortical) system is only capable of processing stimulus and contextual elements separately, it is plausible that the hippocampus is capable of processing the relations between stimulus <u>and</u> contextual elements (see Rudy and O'Reilly, 2001). How should we understand the possible nature of the contextual information / conjunctive representations at play in the unusual case of film viewing, and how does it square with Fodor's functional account (see Table 3.8)?

(1) Contextual information: viewing situation. Significantly, the hippocampal formation may be capable of discriminating genuinely emotional situations from apparently emotional ones on the basis of context alone. By way of an example, LeDoux

(2002, p.216) states that 'a beast in the wild elicits fear, but one in the zoo just fascinates'. This type of scenario suggests the following possibility. A snake viewed in the context of a real-world environment might elicit full-blown fear, whereas a film of a snake viewed in the context of a theatre might elicit a lesser form of that emotion or a completely different emotional state. In the latter case, the contextual cues might include the rows of seats and the edges of the screen (visual elements), as well as the crackle of sweet wrappers, the feel of the seat, and the smell of popcorn (auditory, tactile, and olfactory elements); in other words, those aspects of the situation which would be 'ignored' by a modular visual system with respect to the processing of the projected image itself. In summary, LeDoux's account of the hippocampus presents us with a possible instance of what could be described as 'stimulus-driven' discrimination; i.e., discrimination which is led by cues in our environment rather than being dependent on a conceptual awareness of the true nature of the viewing situation.[12] Considering this point, it is uncertain whether or not the inputs to the amygdala should be regarded as 'deep' in the Fodorian sense described.

(2) Contextual information: diegesis. Although we are primarily concerned with contextual information relating to the viewer's theatrical environment, it should be acknowledged that the hippocampal formation may be capable of processing contextual information relating to the diegetic world of the film. For instance, it seems plausible that a snake presented in the context of a wildlife documentary is less likely to elicit fear than a snake presented in the context of a narrative film. And with respect to narrative films, it seems plausible that the artificial snake in a film such as *Anaconda* is less likely to elicit fear than the real snakes in a film such as *Raiders of the Lost Ark*. One could point to the fact that the snake in the former film, despite being larger than life, is not sufficiently convincing as an 'emotional stimulus'. One could also argue, however, that the diegetic context of *Anaconda* (as a Hollywood 'B-movie') is altogether less realistic than the diegetic context of *Raiders* (as a Hollywood 'A-movie'), despite both films possessing fantastical elements. The fact that the neurobiological account cannot distinguish between the processing of 'viewing' and 'diegetic-based' elements reveals a potential shortcoming (which may need to be addressed by appealing to more obviously cognitive approaches).

[12] Is this really an instance of 'lower-level' or 'stimulus-driven' discrimination? Perhaps the point can be made more forcefully as follows. LeDoux (2002, p.215) claims that 'when a rat is conditioned to a tone-shock combination in a certain chamber, it will freeze and otherwise act afraid if it simply finds itself back in the chamber at some later point'. The rat's sensitivity to the *context* of the chamber is mediated by the hippocampus. It is unlikely, however, that the rat has a conceptual awareness of the chamber in the Fodorian sense described.

(i) Conceptual information from central (prefrontal) systems

The second potential candidate for the 'high road' is the prefrontal-amygdala circuit. As noted previously, the prefrontal cortex is the part of the neocortex which has expanded most in humans. Although we have conjectured that the prefrontal cortex may play a role in the cognitive appraisal of a situation's emotional significance, we are currently concerned with a number of alternative functions. Given the prefrontal cortex's privileged status, LeDoux proposes that the prefrontal cortex processes *conceptual information* which may influence the activity of the amygdala accordingly (whilst describing the *medial* prefrontal cortex as an 'interface' between cognitive and emotional systems). More specifically, the prefrontal cortex is thought to play a role in a variety of executive functions, including the processing of *metarepresentations*: that is, representations of our relations to other representations (see O'Reilly and Munakata, 2000, pp.403-407; Sperber, 2000). How should we understand the possible nature of the conceptual information / metarepresentations at play in the unusual case of film viewing, and how does it square with Fodor's functional account (see Table 3.8)?

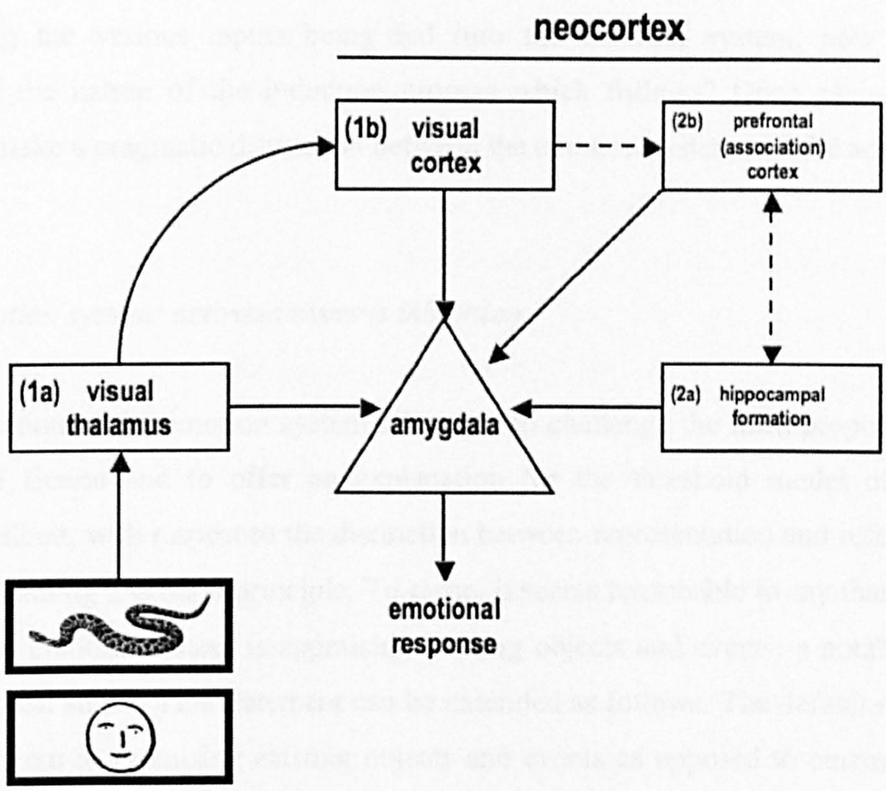
(1) Conceptual information: viewing situation. The above points suggest that the prefrontal cortex is involved in our centrally-mediated capacity to successfully discriminate a cinematic representation of a snake from an actual snake. Whereas the visual (cortical) system would process an object representation of the apparent snake in our environment, it is plausible that the prefrontal cortex would process a conceptual representation of our relation to that object representation (and, therefore, to the object itself), be it a relation of observing a real world event or viewing a film of one. Although central processing may be distributed across the whole brain - and although epistemic mental states such as non-existence beliefs cannot be pinned down in a neurobiological sense - we can tentatively suggest that the 'deep inputs' produced by such processing exert an influence on the amygdala *via* the (medial) prefrontal cortex in its role as an 'interface'.

(2) Conceptual information: diegesis. Before exploring this idea further, it should be acknowledged that the prefrontal cortex may be capable of processing cognitive information relating to the diegesis: for instance, rattlesnakes are dangerous, poisonous, and so forth. In this respect, Jon Teasdale (1999) observes: 'It is striking that there is little mention of speech-level or propositional-conceptual processing in LeDoux's accounts.' (Once again, the fact that the neurobiological account cannot distinguish between the

processing of 'viewing' and 'diegetic-based' elements reveals another potential shortcoming.)

(3) Inhibitory processing. Significantly, the prefrontal cortex also plays a role in the monitoring and management of emotion. LeDoux suggests that the (medial) prefrontal cortex plays a role in the *inhibition* of inappropriate emotional responses. In a related fashion, Damasio (1994) describes the unfortunate case of Phineas Gage. In New England, 1848, Gage was involved in a railroad accident - an iron bar pierced his brain, causing damage to the (ventromedial) prefrontal cortex. Afterwards, he became incapable of inhibiting inappropriate emotional behaviour - shouting, swearing, and so forth. Although Gage's case is an extreme example, it vividly demonstrates the importance of an inhibitory process which exerts a continual influence on our emotional lives and which we may take for granted. Some theorists have argued that the prefrontal cortex specializes in 'activation-based processing' as opposed to 'inhibitory processing' (see O'Reilly and Munakata, 2000, p.404). From our perspective, however, the essential point is that the cognitive (prefrontal) system is capable of *over-riding* the 'conclusions' of other systems, regardless of the manner in which this is achieved; in this respect, the term 'inhibition' can be used in a partially descriptive or metaphorical sense. In summary, cognitive (prefrontal) systems both *inform* our emotion system about the true nature of the events taking place in our environment and *inhibit* our emotion system accordingly. Perhaps we should think of these two aspects - information and inhibition, 'content' and 'end-result' - as different ways of describing the same process.

Figure 3.9: The emotion system: cinematic encounters



Adapted from Figure 6.15 ('The Amygdala: Hub in the Wheel of Fear') from LeDoux (1998), p.170, and Figure 69.2 from LeDoux (1995), p.1053.

Table 3.8: Inputs to the emotion system (amygdala)

	neurobiological account (re. LeDoux): origin of input	**functional account (re. Fodor): content of input**
1a	sensory (thalamic) systems *	shallow: e.g., "snake" (stimulus features)
1b	perceptual (cortical) systems	shallow: e.g., "snake" (object representation)
2a	central (hippocampal) systems *	deep: e.g., "snake and [filmic] context" (conjunctive representation)
2b	central (prefrontal) systems	deep: e.g., "film of snake" (metarepresentation)

* Not predicted by Fodorian account.

(c) Induction

Considering the various inputs being fed into the emotion system, how should we understand the nature of the induction process which follows? Once again, it will be helpful to make a pragmatic distinction between the emotion system and the action system.

(i) The emotion system: activation versus inhibition

A consideration of the emotion system allows us to challenge the third proposition of the paradox of fiction and to offer an explanation for the threshold model of emotional influence; albeit, with respect to the distinction between representation and referent. Let us begin by outlining a general principle. To recap, it seems reasonable to say that the default mode of the emotion system is appraising *existing* objects and events; a notable example being an actual snake. This statement can be extended as follows. The default mode of our emotion system is appraising *existing* objects and events as opposed to cinematic objects and events: for instance, actual snakes as opposed to films of snakes. Contrary, therefore, to the implications of Radford's example of the man's 'harrowing story' about his sister, existence beliefs are not required to activate our emotion system; rather, *non-existence beliefs* are required to *inhibit* our emotion system, thereby preventing it from running in the default mode in question. Similarly, contrary to the implications of Coleridge's illusion theory, responding emotionally to a film of a snake does not require the 'willing suspension of disbelief'; rather, it requires the '*un*willing *application* of disbelief'. If we managed to achieve the mental feat in question, then we would feel obliged to run out of the cinema, in the manner of the mythical 1895 viewer of the Lumière brothers' film described in Chapter 2.

How would this principle work in practice? If we combine LeDoux's neurobiological account of the emotional brain with Fodor's functional account of the modular mind, we arrive at the following hypothesis (see Figure 3.10). *(1) Perceptual systems*. The first half of the threshold model concerns the realism of the cinematic picture-snake (or the cinematic picture-face). In virtue of being 'informationally encapsulated', the perceptual - thalamic and cortical - systems would produce the basic categorization, "A snake of such-and-such a description" as a shallow input. This account provides us with a more precise way of understanding Wittgenstein's notion of 'regarding-as' (and Gibson's theory of direct perception). *(2) Central systems.* In contrast, the second half of the threshold model concerns the reality-status of the picture-snake (or the picture-face). In virtue of being sensitive to epistemic mental states such as non-existence beliefs, the central - hippocampal and prefrontal - systems would produce the abstract categorization, "Cinematic representation of a snake of such-and-such a description" as a deep input. This account provides us with a more precise way of understanding Wittgenstein's notion of 'seeing-as' (adapted by Fodor and Pylyshyn in a criticism of Gibson's theory). *(3) Emotion system.* Considering that our emotion system (amygdala) would receive both shallow and deep inputs simultaneously, we have a possible case of the blind being led by the foolish as well as the (apparently) wise. Our capacity to respond emotionally to the picture-snake, therefore, can be thought of in terms of an ongoing conflict between contradictory signals - resulting in both the activation and inhibition of the emotion system - where the balance of power continually changes according to the strength of the emotional stimulus presented and the nature of the viewing situation on the one hand, and the nature of our (conscious) attention on the other. If the 'activation level' of the emotion system exceeds a certain 'threshold', then the system will generate an emotional response of a certain 'strength'.[13]

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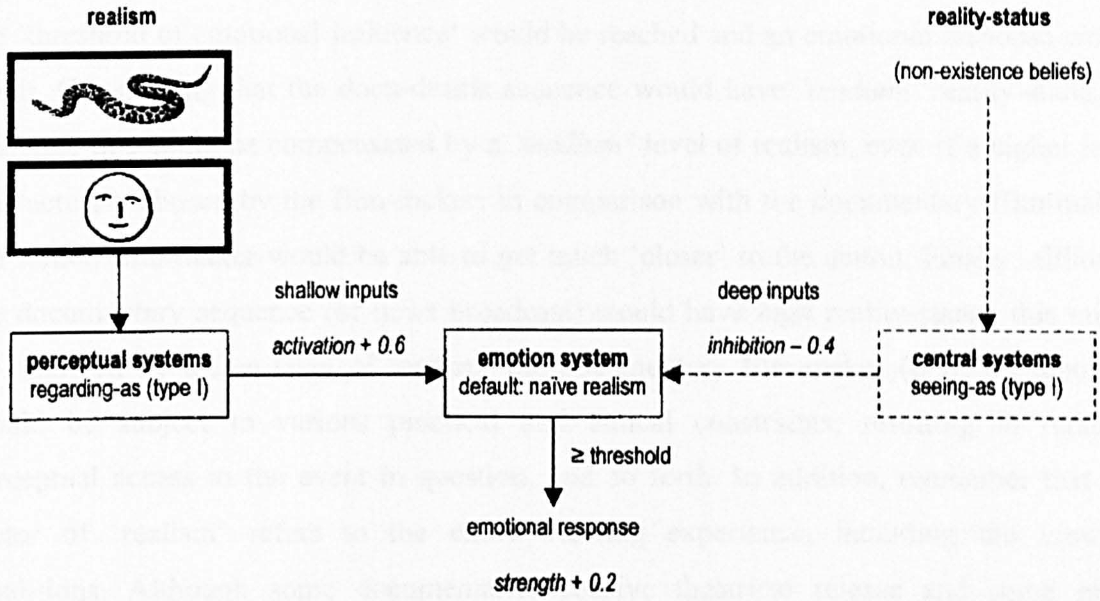
[13] Thanks to Gregory Ashby at the Department of Psychology, UCSB, for two discussions about the applicability of LeDoux neurobiological account to the case of film viewing. Ashby introduces a developmental element into the equation. The prefrontal cortex does not stop growing until we are in our later teens: this fact may partly explain why adults tend to be better at inhibiting their emotional responses than children, and also why they may be less susceptible to the horrific content of certain films. Thanks also to Jeff Niehaus and Tim German for recognizing some interesting parallels between the proposed account and German et al.'s work on belief-desire reasoning in children, and for inviting me to present a paper at a graduate seminar on developmental and evolutionary psychology. Some theorists argue that a young child fails the 'false belief task' because they do not yet have the concept of false belief. In opposition, German et al. make two key points. First, a child *does* have the concept of false belief; rather, they are incapable of *inhibiting* the 'default mode' of the corresponding computational system. Second, although 'belief-desire reasoning' may be distributed and difficult to pin down in neurobiological terms, the (medial) prefrontal cortex is singled out as playing the inhibitory role in question.

Figure 3.10: The emotion system: activation versus inhibition



N.B. For the sake of simplicity, the perceptual systems have not been divided into thalamic and cortical systems, whilst the central systems have not been divided into hippocampal and prefrontal systems. The numbers for activation, inhibition, and response strength are arbitrary and included for illustrative purposes.

Considering the limitations of current brain imaging techniques and the intractability of the frame problem, a neurobiological approach does not enable us to separate the central process which distinguishes representation from referent, from the central process which distinguishes fiction from non-fiction. In light of the discussion of positive and negative constraints, however, we are able to make a distinction between our reception of fiction and non-fiction in terms of the general nature of the shallow inputs feeding into the emotion system. To take an extreme example, say that we are shown three film sequences featuring a soldier being shot down in combat: (1) a fiction film; (2) a docu-drama based on a specific event; and (3) a documentary (or news broadcast). How might our (emotional) reception of these three sequences differ?

Radford and co. would assume that any difference lies in the factor of reality-status alone: viz., in the first instance, we do not hold the requisite 'existence beliefs', whereas in the second and third instances we do. The threshold model suggests that they are only considering one half of the story (see Table 3.9). Although the fictional sequence of the soldier would have *low* reality-status, this might be compensated by a *high* level of realism: with respect to perceptual access, for instance, the fiction film-maker would be able to film the soldier from close-up in high resolution, wide screen format. As a result, the 'threshold of emotional influence' would be reached and an emotional response would occur. Considering that the docu-drama sequence would have *'medium'* reality-status, in principle this could be compensated by a *'medium'* level of realism, even if a higher level was actually chosen by the film-maker: in comparison with the documentary film-maker, the fiction film-maker would be able to get much 'closer' to the action. Finally, although the documentary sequence (or news broadcast) would have *high* reality-status, this might be hindered by a *low* level of realism: the documentary film-maker (or news reporter) would be subject to various practical and ethical constraints, resulting in reduced perceptual access to the event in question, and so forth. In addition, remember that the factor of 'realism' refers to the entire viewing experience, including the viewing conditions. Although some documentaries receive theatrical release and some news broadcasts are presented on large screens in public places, non-fiction is typically viewed on a television screen in the home, resulting in reduced perceptual salience. Contrary to our intuitions, therefore, the emotional influence of the documentary sequence might be at best, equal to - and at worst, less than - that for the fictional sequence.

Table 3.9: Inhibiting the emotion system: fiction versus non-fiction

	reality-status (central systems)	**realism (perceptual systems)**		
	deep inputs	**negative constraints**	**perceptual access**	**shallow inputs**
(1) fiction	fictive stance: high inhibition	none (?)	close	high activation
(2) docu-drama	fictive stance: medium inhibition	none (?)	close	high activation
(3) documentary	no stance: low inhibition	practical, ethical	distant	low activation

(ii) The action system: engagement versus disengagement

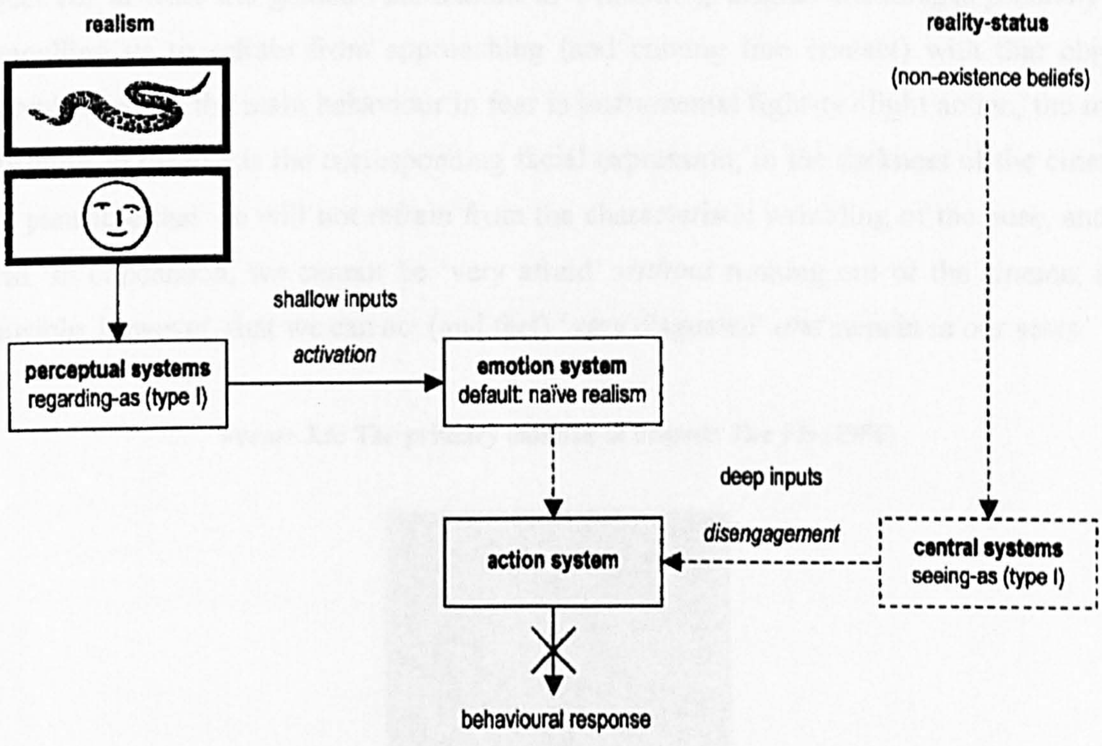
Although the cognitive (prefrontal) system may be capable of inhibiting the emotion system (amygdala), the connection between the two is problematic. First, emotion 'induction sites' are located in subcortical regions which are beyond conscious access. According to LeDoux (1998, p.303), for instance, the projections from the cortex to the amygdala are outnumbered by/less dominant than the projections from the amygdala to the cortex; in other words, conscious cognitions can trigger, but not control, our emotions. Second, the physiological responses necessary for emotional experience are mediated by the autonomic nervous system which, by definition, is beyond voluntary (conscious) control. Is there a more concrete alternative? Tooby and Cosmides (2001) state: 'While a cinematic version of a lion may evoke terror, the flight behavior that terror is ordinarily designed to produce is disengaged: We do not run from the theater.'[14] The 'intimate connection' between the 'central systems' and the behavioural component may provide us with the alternative we require: first, there are (direct) projections from the prefrontal cortex to the premotor and motor cortices (see Currie and Ravenscroft, 1997); and second, motor (behavioural) actions are mediated by the somatic nervous system which is largely *within* voluntary (conscious) control.

This move brings us to what LeDoux (1998, p.177) describes as 'the crucial shift between reaction and action'; or, in the unusual case of film viewing, the crucial shift between reaction and *non*-action - and the role of what could be described as *social display rules*. Damasio (1994, p.133) argues that consciousness provides us with an 'enlarged protection policy', thereby allowing for more 'flexible' and (socially) appropriate responses. In a related fashion, Jeffrey Gray (1999) suggests that consciousness functions as a late 'error-detection system' which is capable of inhibiting inappropriate motor responses; according to this view, consciousness 'monitors' rather than 'guides' our emotional behaviour. (Gray cites Benjamin Libet et al.'s (1991, p.1754) claim that '[c]onscious sensory awareness can lag behind the real world by as much as 0.5 s.')

[14] For Cosmides, the fact that the emotion system is engaged, whereas the action system is disengaged, is one of the main features of interest with respect to film viewing (personal communication). It should be noted that Tooby and Cosmides's distinction between the 'emotion system' and the 'action system' is an over-simplification: as discussed previously, it is plausible that emotions comprise actions, and that emotional experience depends on the somatic feedback resulting from such actions. In light of this, their distinction really amounts to the difference between the physiological (autonomic) and the behavioural (somatic) components of the emotional process.

Although it has been argued that it may be best to consider our discriminatory capacity in terms of (nonconscious) central processing, the basic point remains the same: the higher levels of the mind/brain over-ride the erroneous conclusions of the lower levels. The alternative (or complementary) scenario can be summarised as follows (see Figure 3.11): even if we cannot switch our emotions on and off at will, we can prevent ourselves from running out of the cinema at the sight of the snake or the monster, and we can prevent ourselves from helping a character (say, a wounded soldier) in distress. (It should be noted, however, that we may engage in relatively inconspicuous fear behaviours, such as clutching the arms of our seat (see Walton, 1978). In addition, we may experience muscular tension: 'efferent inpulses' may be transmitted to the striated muscles, as measured by electromyography.)

Figure 3.11: The action system: engagement versus disengagement



N.B. This diagram is to be considered in conjunction with Figure 3.10.

It is intriguing that certain emotions seem to be more susceptible to the paradox of fiction than others. Consider, for example, David Cronenberg's 1986 remake of *The Fly*: following a failed attempt at teleportation, inventor Seth Brundle (played by Jeff Goldblum) becomes an unnatural 'fusion' of the cultural categories of 'man' and 'insect' (see Frame 3.5). In the second half of the film, we witness the eponymous Fly overtaking Brundle's body like some sort of degenerative disease. In the closing scene, the 'Brundle-Fly' - transformation complete - threatens Seth's former girlfriend Veronica (Geena Davis) and kills Veronica's boss and former lover Stathis (John Getz) by vomiting an acidic substance on his hand and foot.

From our perspective as viewers, which emotion is most appropriate here? Although the film's advertising slogan famously states 'be afraid, be very afraid', a stronger case could be made for our being 'very disgusted'. To begin with, the claim "I was afraid of the image of the Brundle-Fly" certainly seems to be more problematic than the claim "I was disgusted by the image of the Brundle-Fly" - simply compare the role of the prepositions 'of' and 'by' in the respective sentences. A more precise answer, however, can be spelt out in terms of either the engagement or disengagement of the action system. First, whereas genuine fear necessarily involves *active* withdrawal from the offending object (or at least the genuine inclination to withdraw), disgust encourages *passivity* by compelling us to refrain from approaching (and coming into contact) with that object. Second, whereas the main behaviour in fear is instrumental fight-or-flight action, the main behaviour in disgust is the corresponding facial expression; in the darkness of the cinema, it is plausible that we will not refrain from the characteristic wrinkling of the nose, and so forth. In conclusion, we cannot be 'very afraid' *without* running out of the cinema; it is plausible, however, that we can act (and feel) 'very disgusted' *and* remain in our seats.

Frame 3.5: The primary emotion of disgust: *The Fly* (1986)

In certain circumstances, it should be acknowledged that the action system for disgust may be disengaged in a similar way as the action system for fear. This acknowledgement brings us to the role of *cultural display rules*. Ekman and Friesen (1975) investigated the effect of cultural factors on the facial expression of disgust.[15] In this experiment, American and Japanese subjects were videotaped whilst being shown neutral films and stress-inducing films (featuring disgusting subject matter). From our perspective, the significant aspect of the experiment is the subjects' responses to the stress-inducing films. In the absence of an interviewer, the American and Japanese subjects 'displayed' facial expressions of disgust to a similar extent. In the presence of an interviewer, however, the Japanese showed less disgust and tended to smile more frequently (in relation to the Americans). More significantly, slow-motion video replays revealed that the Japanese *began* to display the relevant facial expressions, but managed to suppress, or 'mask', these expressions several hundred milliseconds later. For our purposes, the slow-motion replays demonstrate - or at least suggest - that the conscious awareness preceding the presentation of an emotional stimulus (in this particular case, the Japanese subjects' awareness of the presence of the interviewer) cannot affect the early stages of 'basic' emotional responses, but *can* exert an influence on the overall expression of such emotions a fraction of a second later when consciousness has 'caught up'.[16]

Table 3.10: Disengaging the action system: the role of display rules

	fear	**disgust**
(1) physiological component **- autonomic** **- involuntary, invisible**	sympathetic responses: not subject to display rules	parasympathetic responses: not subject to display rules
(2) behavioural component **- somatic** **- voluntary, visible**	flight: subject to social display rules	facial expression: subject to cultural display rules

[15] For a good summary, see Evans (2001), pp.15-16. Fridlund (1994) offers an alternative interpretation (personal communication).

[16] The technique of electromyography demonstrates that even when such expressions are successfully inhibited, the corresponding 'efferent inpulses' may be transmitted to the peripheral organs (cf. Ekman, 1984, pp.335-336). This suggests that the action system is only disengaged at the very last instant.

(d) Responses, feedback, interpretation, and organization

How should we understand the response stage of the emotional process? In order to answer this question, we must address two related conundrums: first, should we regard our emotional responses to fiction films from, say, the horror and war genre as either 'real' or 'quasi'?; and second (assuming that the former is the case), why do we choose to subject ourselves to horrifying objects and events, and the negative emotions which accompany them (the so-called paradox of horror)?

(i) Real or quasi emotions?

Another potential way of solving the paradox of fiction is to challenge the second proposition by replacing real emotions with 'pretend' or 'quasi emotions'. Carroll (1990) and others attribute the *pretend theory* to Kendall Walton (1978). Walton considers it to be 'a principle of common sense' that emotions such as fear require existence beliefs (p.6). In light of this principle, he suggests that when we consume fictions, we engage in a game of make-believe: for instance, we pretend to believe that the proverbial snake or monster on the screen is real and a genuine threat to ourselves, using the corresponding images and sounds as 'props'. As a result, we experience 'pretend fear' or 'quasi-fear sensations' with physiological and behavioural components.

Whether or not the pretend theory is attributed to Walton, a straightforward 'either-or' distinction between 'real' and 'quasi emotions' is untenable, our emotional responses to both the real world and the cinema involving many of the same pathways and systems (see Figure 3.12).[17] To begin with, research suggests that films of frightening and disgusting subject-matter are capable of eliciting the (real) physiological and behavioural components of an emotional response.[18] Following the James-Lange theory of emotion - and Damasio's

[17] In a later article, Walton (1997) argues that it was not his intention to question the claim that our emotional responses to fiction are 'genuine' (p.38). Instead, his intention was to explain such responses by introducing the general notion of make-believe. Rather than challenging the second proposition, therefore, Walton can be regarded as challenging the third proposition by replacing existence beliefs with pretend beliefs; in this respect the pretend theory resembles the thought / simulation theory - to be discussed in Chapter 5.

[18] For evidence that images of frightening subject-matter are capable of eliciting physiological arousal in normal ('neurologically intact') subjects, we can consider some of the communications research literature on fright responses to horror films (see Cantor, 2002, for a review). For evidence regarding images of disgusting subject-matter, we can consider the experiments by Lazarus and his colleagues in the 1960s which used films

account of somato-visceral feedback - information regarding our somatic and visceral body states would be fed back to the somatosensory regions of the brain, where it would be attended and made conscious. If anything, the controversy surrounds the status of the subjective component. Following the Schachter-Singer theory of emotion - and Gazzaniga and LeDoux's account of conscious interpretation - we would attribute the somato-visceral arousal to the most salient objects in our environment. In light of this, the emotion of fear presents us with a strange, and potentially irresolvable, duality. On the one hand, the most salient objects in our environment - especially considering the viewing conditions - would be the *apparently* real objects presented by the film; it is plausible, therefore, that the negative arousal would be attributed to either the snake or the monster and labelled as 'real fear'. On the other hand, at some level the virtual status of the snake or monster would be recognised: it is also plausible, therefore, that the negative arousal would be labelled as 'quasi fear'. In contrast, the emotion of disgust might largely sidestep this duality. Given that we do not seem to have any conceptual difficulty with the notion of our being genuinely disgusted by either an image or a sound (for the reasons discussed above), we might label the negative arousal as 'real disgust'. (Whatever the status of the subjective component, it will be argued that the physiological and behavioural components may serve as affective and motivational prompts.)

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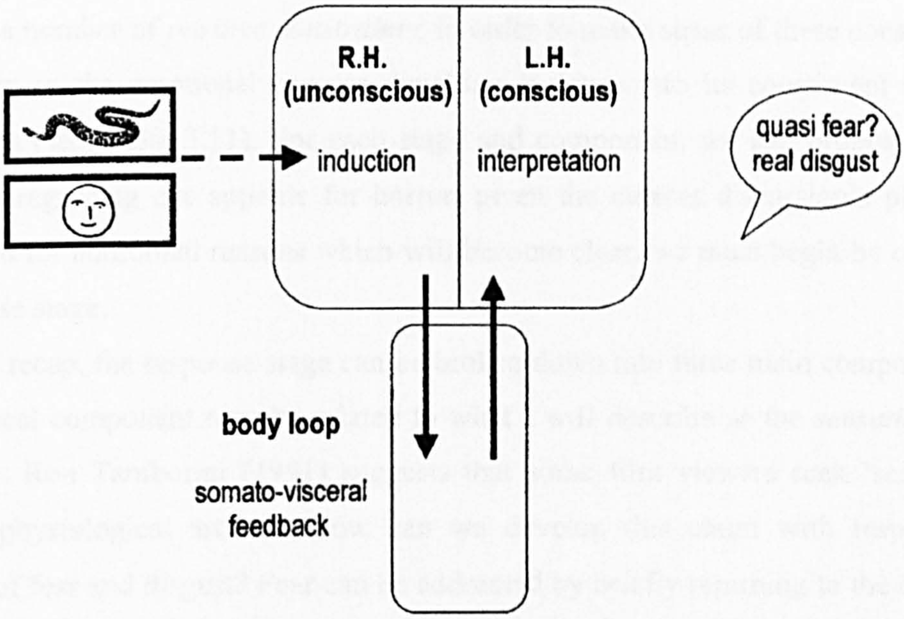
of surgical operations, and Damasio's (1994) claim that photographic slides of mutilations and so forth are capable of eliciting strong galvanic skin responses (GSRs) in 'neurologically intact' subjects.

Figure 3.12: The roles of somato-visceral feedback and conscious interpretation



N.B. This diagram is a composite of Figures 3.4 and 3.5. The left and right hemispheres have been reversed for ease of representation.

(ii) Solving the paradox of horror

Although Carroll (1990) offers a solution to the paradox of fiction (namely, the thought theory), he proposes two separate solutions to the paradox of horror. The *general theory* proposes that horror is the price we pay for satisfying our curiosity about the film's narrative, whilst the *universal theory* proposes that the 'monster' - as a violation of cultural categories - is an object of fascination. The two theories are inter-related to a certain extent: for instance, the monster as an object of fascination may trigger our curiosity about the film's narrative. By appealing, then, to curiosity and fascination, Carroll explains our appetite for horror in primarily 'cold', cognitive terms. It is not my intention to question the value of the 'curiosity-fascination hypothesis' for it seems entirely plausible that both curiosity and fascination play an important role in our viewing experience.[19] In contrast to Carroll's approach, however, I would suggest that a solution to the paradox of fiction may

[19] Also see Smith (2000), pp.79-81. Smith extends the universal theory by making a case for 'morbid curiosity'.

lead to (at least) a partial solution to the paradox of horror. How might the two paradoxes be connected? Contrary to certain intuitions, our appetite for experiencing horror may be subject to a number of *positive constraints*; in order to make sense of these constraints, we must return to the emotional process, breaking it down into its constituent stages and components (see Table 3.11). For each stage and component, we can propose a distinct hypothesis regarding our appetite for horror; given the current discussion's place in the chapter and for additional reasons which will become clear, we must begin by considering the response stage.

To recap, the response stage can be broken down into three main components. The physiological component may be related to what I will describe as the *sensation-seeking hypothesis*. Ron Tamborini (1991) suggests that some film viewers seek 'sensation' in terms of physiological arousal. How can we develop this claim with respect to the emotions of fear and disgust? Fear can be addressed by briefly returning to the experiment by Schachter and Singer. The results of this experiment suggest that the *presence* of adrenaline may be pleasurable - or at least interpreted as so - if it occurs in the *absence* of a certain cognitive component: namely, the component which tells us that we are in genuine danger. What about disgust? In contrast to both vision and audition, several theorists propose that disgust originated as an oral rejection of food and is therefore associated primarily with the senses of smell, taste, and touch. In light of this, the *presence* of visually or aurally-induced disgust may be pleasurable - or at least, tolerable - if it occurs in the *absence* of the modalities in question. Carroll briefly considers something akin to the sensation-seeking hypothesis, but he rejects it on the grounds that it is overly general and probably applies to every popular genre (ibid., p.167). If we take into account Ekman's claims about the specificity of ANS 'patterns', however, then we might be able to make a case for the appeal of the horror and war genres in particular.

What about the behavioural and subjective components of the emotional process? The behavioural component may be related to what I will describe as the *bravado hypothesis*. Tamborini suggests that the appeal of horror may lie in the opportunity for viewers to display 'gender-specific behaviours'; for instance, male viewers may opt for bravado either by not reacting to what they see or by positively laughing in its face, whereas female viewers may opt for the complete opposite either by hiding behind their hands or by screaming out loud. We need not accept the sexist assumptions which lie behind such a hypothesis, however. Given that behaviour is within voluntary control, the crucial point is that horror and war films provide viewers of either sex with an opportunity to test their strength and resolve in the manner described. Finally, the subjective component may be related to the *escapist hypothesis*. Although many aspects of our overall phenomenological experience may be unpleasant, the feelings associated with fear and disgust may provide us with the opportunity to escape from (and forget) our everyday concerns; indeed, one could argue that they almost force us to do so.

The story does not end there, however. A move 'backwards' to the induction stage of the emotional process brings us to what I will describe as the *organizational hypothesis*. To set the scene, Cosmides and Tooby (2000, 2001) propose that a psychological adaptation is capable of operating in two distinct modes. The first and more obvious mode of operation is described as the *functional mode*: an adaptation is operating in this particular mode when it is performing the function for which it was biologically 'intended'. From our perspective, prime examples include the visual system solving the adaptive problem of scene analysis, and the emotion system appraising actual objects and events. Ironically, although Radford and co. explicitly reject 'biological facts', they must implicitly subscribe to the functionalist perspective: viz., our capacity to engage emotionally with fiction is problematic (partly) because it does not serve an obvious function in relation to the real world (cf. p.8).

This implicit assumption brings us to the next part of Cosmides and Tooby's theory. The second and less obvious mode of operation is described as the *organizational mode*: an adaptation is operating in this particular mode when it is 'organizing' its internal structure. Significantly, this organizational process can be achieved by engaging with phenomena which are more typically associated with the domain of aesthetics. Furthermore, our psychological make-up may motivate us to attend to the phenomena in question by making the corresponding experience 'intrinsically rewarding'. With respect to perception, for instance, 'complex skyscrapes and landscapes' may be 'experienced as beautiful because their invariant properties allow them to function as test patterns to tune our perceptual machinery' (p.17). With respect to emotion, on the other hand, the emotional scenarios presented by fiction may activate 'previously dormant algorithms' and adjust 'motivational weightings'. Presumably, the algorithms in question comprise the induction (appraisal) stage of the emotional process (stage 2). Why, then, have we waited until this point of the chapter to discuss the organizational mode? Crucially, Cosmides and Tooby imply that the corresponding 're-weightings' are dependent on feedback from our emotional responses (stage 3). In other words, the organizational process may only begin *after* the physiological, behavioural, and subjective components have been brought into play. Interestingly, Cosmides and Tooby contrast their notion of the organizational mode to Aristotle's notion of *catharsis*, presumably assuming that 'catharsis' translates as the 'purging' of emotions. Considering, however, that some theorists - for example, Martha Nussbaum (1986), p.388 - have suggested that 'catharsis' also translates as the 'clarification' of emotions, the authors may be closer to Aristotle than they realise.

Table 3.11: The film viewer: positive constraints on experiencing horror

	positive constraints	description
(1) inputs	(1) sensory system	organizational hypothesis
	(2) perceptual system	(perceptual 'tuning')
(2) induction	(1) emotion system	organizational hypothesis
	(2) cognitive (appraisal) systems	(emotional 'clarification')
	(1) physiological component	sensation-seeking hypothesis
(3) responses	(2) behavioural component	bravado hypothesis
	(3) subjective component	escapist hypothesis (?)

N.B. According to the organizational hypothesis, feedback from stage 3 (responses) may change the 'motivational weightings' of the various algorithms which comprise stage 2 (induction). Although the organizational hypothesis associated with stage 1 (inputs) is not directly relevant to either the subject of emotions or the paradox of horror, it is included for the sake of balance and interest.

How should we understand the role of the organizational mode with respect to the emotions of fear and disgust on the one hand, and the ritual of film viewing on the other? Let us answer this question by first posing another. To what extent do our fear and disgust systems operate in the *functional mode* on an everyday basis? Starting with fear, think back to our hunter-gather ancestors who may have experienced frequent 'life-or-death' encounters with the snakes and lions cited above, along with violent conflicts with other tribes, and so forth. In contrast, our opportunities to experience 'life-or-death' fear in the modern (western) world and a post-industrial society are subject to a number of *negative constraints* (see Table 3.12). From a scientific and technological perspective, improvements in safety and the like have removed various potential dangers from our environment: for instance, humans as a species have succeeded in taming much of the animal world whilst resisting the worst effects of the elements. The majority of constraints, however, have an ethical dimension. From a socio-cultural perspective, people's attitudes generally incline towards creating a world which minimises the possibility of dangerous scenarios arising: for instance, violence is usually rejected in favour of pacifism as a way of conducting our affairs. Similarly, in the political realm, the possibility of fascism and war is reduced by the pursuit of democracy and peace, whilst in the legal realm, the possibility of anarchy is reduced by the pursuit of law and order. In summary, then, the nearest many of us come to encountering physical danger is a brawl in the schoolyard during our childhood and teenage years. Unfortunately, short-term 'life-or-death' fear has been replaced by long-term 'existential' fear: for instance, anxieties about what will happen tomorrow, and the next day, and the day after that. Although such anxieties employ the same 'fear circuits' - and presumably the same inhibitory mechanisms - they may be far harder to cope with, as evidenced by the rising incidence rates of various anxiety disorders.

What about disgust? In this case, perhaps, we only have to think back to the time of the 'Black Death' - when, for example, sewage flowed down the streets - to understand that our opportunities to experience 'full-blown' disgust in the modern (western) world are subject to a similar set of negative constraints (see Table 3.12). From a scientific and technological perspective, for instance, the development of sewerage systems has resulted in a substantial improvement in sanitation, whilst the development of domestic cleaning products has resulted in a substantial improvement in cleanliness and hygiene in the home. Once again, these developments are supported by ethical considerations. From a socio-cultural perspective, people's attitudes have generally inclined towards higher standards of sanitation, cleanliness, and hygiene. In the political and legal realms, furthermore, these standards are governed to a greater or lesser extent by various policies and laws respectively.

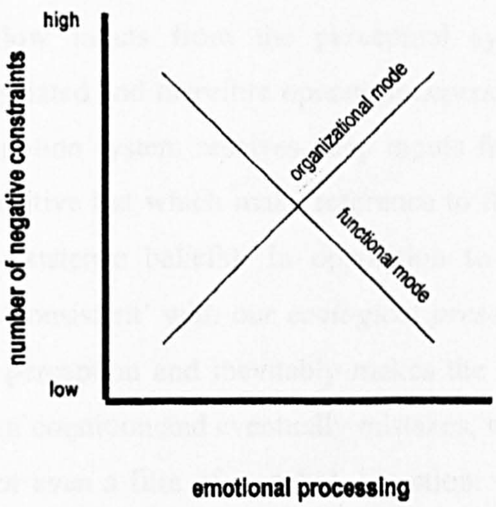
Table 3.12: The real world: negative constraints on experiencing horror

	negative constraints	description
(1) opportunities to experience fear?	scientific / technological	improvements in safety (etc.)
	socio-cultural	attitudes re. pacifism (etc.)
	political	democracy and peace
	legal	law and order
(2) opportunities to experience disgust?	scientific / technological	improvements in sanitation (etc.)
	socio-cultural	attitudes re. cleanliness and hygiene (etc.)
	political	policies governing above
	legal	laws governing above

How do these various considerations help us to answer our original question? The negative constraints imposed by the modern (western) world suggest an *inverse relationship* between the functional and organizational modes which, if anything, favours the ritual of film viewing (see Figure 3.13). If our fear and disgust systems are constrained to operate in the functional mode to a *lesser* extent, then they may need to operate in the organizational mode to a *greater* extent; that is, to achieve the emotional 'clarification' which Aristotle may have alluded to. Considering that horror films, war films, and the like, present an array of fear and disgust stimuli - in what is ultimately a completely safe context - the experience of viewing such films may play a significant role in the organizational process. Furthermore, our psychological make-up may motivate us to view such films by making the corresponding experience 'intrinsically rewarding'. In light of these two points, one could argue that it is in fact *rational* to subject ourselves to horrific subject-matter, contrary to the implications of the paradox of horror. Of course, the modern (western) world may not give us the opportunity to use our 'clarified' fear and disgust systems, but our psychological makeup may be blind to this fact.

On this note, the final issue which we must address is as follows. Given the possibility that film plays a significant organizational role, is our capacity to respond emotionally to film (as an example of fiction) a 'deliberate' *design feature* as opposed to an 'accidental' *byproduct*? To put it another way, does the mind/brain deliberately - as opposed to accidentally - filter 'filmic information' to our emotion system so that we may benefit from its clarificatory effects? I would argue for the negative. According to the argument outlined in this chapter, a filtering process as a design feature is unnecessary because the mind/brain already allows such filtering as a byproduct of its structure. In conclusion, then, it may be the case that our emotion system is only capable of operating in the organizational mode - another possible design feature - because, at some level, the mind fails to distinguish filmic representation from referent; in this respect, the solution to the paradox of horror may be a byproduct of the solution to the paradox of fiction.

Figure 3.13: The relationship between functional and organizational modes



3.4 CONCLUSION

(a) A primary solution to the paradox of fiction

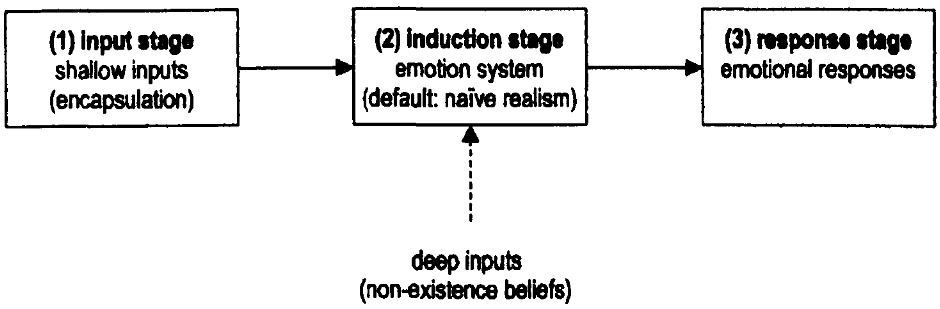
Having outlined a multi-level model of the emotion system from both a neurobiological and a functional perspective, we are in a position to offer a primary solution to the paradox of fiction. To recap, the first strategy is to revise the third proposition of the paradox, whilst the second strategy is to revise the Cartesian framework which underlies the paradox as a whole. In addition, Radford (1975, p.78) assumes an *irrationality theory* of emotional responses to fiction, concluding that the capacity in question 'involves us in inconsistency and so incoherence'. The prescriptive (normative) notion of 'rationality' in operation here must be redefined in order to bring it in line with descriptive (non-normative) views of the mind/brain which have both ecological and evolutionary plausibility.

(i) Revising the third proposition and the Cartesian framework

The multi-level model of the emotion system demonstrates that the third proposition of the paradox of fiction is false: emotions do not require existence beliefs. This point can be illustrated by considering the *induction stage* of the emotional process (see Figure 3.14). To begin with, the 'default mode' of the emotion system is naïve realism; that is, it is concerned with the appraisal of existing objects and events. On the one hand, the emotion system receives shallow inputs from the perceptual systems - systems which are informationally encapsulated and therefore operate independently of existence beliefs. On the other hand, the emotion system receives deep inputs from central systems - systems which are globally sensitive but which make reference to the exact opposite of existence beliefs (namely, non-existence beliefs). In opposition to the irrationality theory, this account is absolutely 'consistent' with our *ecological present*: the emotion system either 'trusts' the results of perception and inevitably makes the occasional error, or it always 'waits' for the results of cognition and eventually mistakes, say, an actual and deadly snake for a harmless stick (or even a film of a snake). Question: what happens when you cross say, 'fast-acting' perception (an 'early-warning system' which effectively sacrifices accuracy for speed) with 'slow-acting' cognition (a late 'error-detection system' which effectively sacrifices speed for accuracy). Answer: a susceptibility to 'false positives' which may *appear* irrational after conscious reflection.

The multi-level model also challenges the Cartesian framework which underlies the paradox of fiction as a whole. Each of the three stages demonstrates the fact that the mind/brain is not a single agent but a society of mental agents: the contradiction which has baffled many art and film theorists does not arise because different 'psychological predicates' can be attributed to different systems or levels of the mind/brain - in other words, 'like' need not be contradicted by 'like'. In opposition to the irrationality theory, this account is absolutely 'consistent' with our *evolutionary past*; indeed, it seems to have an inescapable logic. The development of 'lower-level' perceptual and emotion systems must have preceded the development of 'higher-level' cognitive systems: if our ancestors' perceptual and emotional 'tasks' had not been performed automatically, then they would not have survived to evolve the capacities for language, abduction, and consciousness (see Öhman, 1999, pp.337-339). According to the principle of evolutionary conservatism, furthermore, older and more basic systems will not be discarded in favour of newer and more advanced alternatives. In light of this, our capacity to respond emotionally to cinematic representations may be rational after all.

Figure 3.14: A primary solution (I): Revising the third proposition and the Cartesian framework

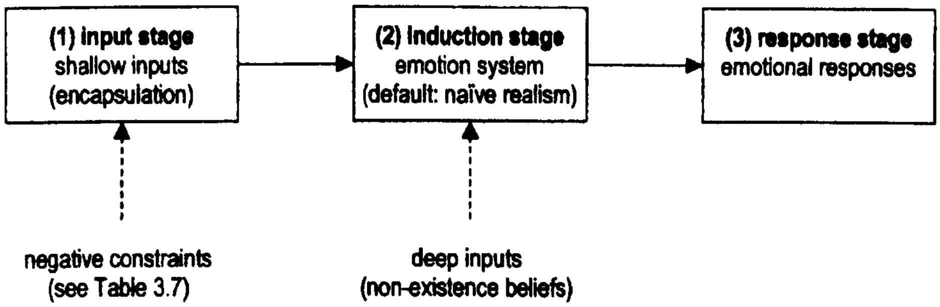


(ii) The role of positive and negative constraints

In addition to outlining a multi-level model of the emotion system from both a neurobiological and a functional perspective, the discussion has introduced a variety of other perspectives into the proceedings: namely, aesthetic, technological, socio-cultural, ethical, political, and legal. Not only can we solve the paradox of fiction by appealing to, say, the role of non-existence beliefs with respect to the induction (appraisal) stage of the emotional process; we can also solve the paradox by appealing to the role of *positive* and *negative constraints* with respect to the *input* and *response stages.*

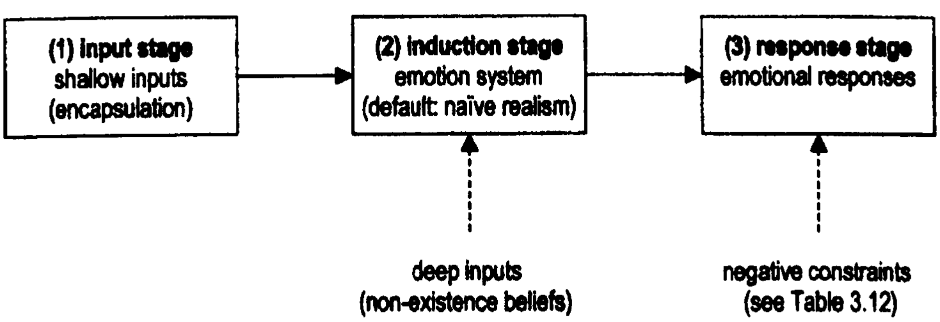
The input stage of the emotional process can be addressed by considering the case of non-fiction films (see Figure 3.15). To recap, Radford and co. assume that the crucial difference between non-fiction and fiction lies in the factor of reality-status alone: in the first instance, we hold the requisite 'existence beliefs', whereas in the second instance we do not. According to the threshold model of emotional influence, however, there is a functional relationship between the factors of reality-status and realism. Although the reality-status of a documentary film is high, the level of realism (salience) is limited by a set of negative constraints (notably, practical and ethical factors).

Figure 3.15: A primary solution (II): negative constraints on non-fiction films



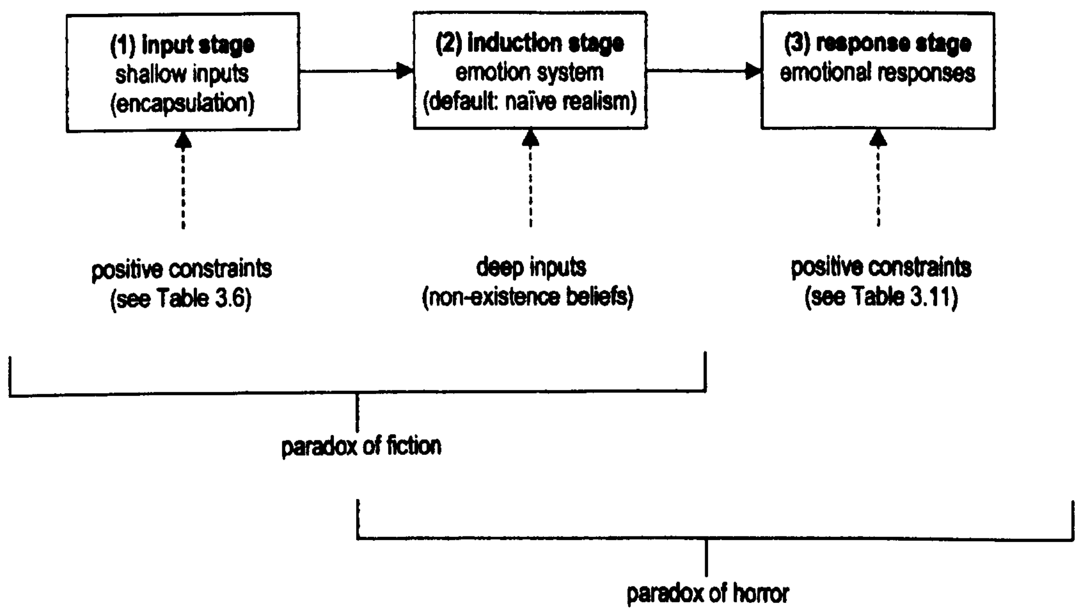
The response stage of the emotional process can be addressed by considering the case of the real world (see Figure 3.16). According to Cosmides and Tooby, our emotion system is capable of operating in a functional mode and an organizational mode. In contemporary western societies, however, the opportunities for our fear and disgust systems to operate in the functional mode are subject to a set of negative constraints (for example, scientific and technological factors). As a result, the onus is placed on the organizational mode. (Of course, these negative constraints could be understood as affecting the input stage; for the sake of balance and comparison, this aspect has not been illustrated.)

Figure 3.16: A primary solution (III): negative constraints in the real world



In contrast to either non-fiction (documentary) films or real world experience, the institution of the fiction film may provide us with the best of both 'worlds' (see Figure 3.17). With respect to the input stage of the emotional process, on the one hand, a fiction film's low reality-status may be compensated by a high level of realism (or salience). As we have seen, the fiction's film 'general trend' towards realism and salience has been facilitated by a set of positive constraints (including advances in aesthetics and technology). With respect to the response stage, on the other hand, the possibility that our fear and disgust systems are constrained to operate in the functional mode to a lesser extent (a negative condition of the real world) may be compensated by the possibility of their operating in the organizational mode to a greater extent (a positive condition of fiction film). In this respect, the solution to the paradox of fiction overlaps with the solution to the paradox of horror.

Figure 3.17: A primary solution (IV): positive constraints on fiction films



(b) Further applications

Although this chapter has focused on the primary emotions of fear and disgust, the aim has been to outline a multi-model of the emotion system which can be applied across the board. In this respect, LeDoux (2002, p.212) states that '[a]lthough different brain circuits may be involved in different emotion functions, the relation of specific emotional-processing circuits to sensory, cognitive, motor, and other systems is likely to be similar across emotion categories.' The nature of the 'emotional-processing circuit' which is activated at any given moment is dependent on the nature of the emotional stimulus, and, in the case of film, the nature of the corresponding scene or genre: LeDoux states that 'a given circuit is only activated when the sensory influx contains stimulus information relevant to its operation' (ibid., pp.206-207).

(i) Other primary emotions

In addition to activating 'fear circuits' in the amygdala and 'disgust circuits' in the basal ganglia, shallow outputs from the perceptual (thalamic and cortical) systems may be capable of activating the circuits underlying a variety of other emotions - including the remaining three primary emotions of *anger*, *sadness*, and *happiness* (see Table 3.13). Damasio (2001, p.61, p.79) states that the principal emotion induction sites are located in four subcortical regions of the brain - namely, the brain stem, hypothalamus, basal forebrain, and amygdala - and one cortical region - namely, the ventromedial prefrontal cortex. He claims that recent studies using PET imaging suggest that the induction of all three emotions involves the activation of a number of these sites, but that 'the pattern [of activation] for each emotion is distinctive'. Similarly, deep outputs from contextual (hippocampal) systems and cognitive (prefrontal) systems may play a role in inhibiting the emotion system and/or disengaging the action system to a greater or lesser extent.

Table 3.13: Primary emotions

		(1) input stage (e.g. film genres)	**(2) induction stage (neural sites)**	**(3) response stage**	
				physiological	**behavioural**
negative / active	**(1) fear**	horror, war	amygdala	sympathetic	'flight' (S)
	(2) anger	action, war	four plus one (distinct pattern)	ibid.	'fight' (S)
negative / passive	**(3) disgust**	horror, war	basal ganglia	parasympathetic	facial exp. (C/G)
	(4) sadness	melodrama	four plus one (distinct pattern)	ibid.	crying (C/G)
pos. / pass.	**(5) happiness**	romance, comedy	four plus one (distinct pattern)	ibid.	smiling, laughing (C/G)

N.B. For each primary emotion, the behavioural (somatic) component is subject to certain display rules: S = social; C = culture-specific; and G = gender-specific.

The primary emotion of anger can be classified as both negative and active - closely related to fear in both the world and the cinema. Starting with the input stage, the most obvious examples of fiction films which are believed to elicit anger - or aggressive tendencies - are provided by the action and war genres: such films often feature a main character (or hero) engaging in aggressive - and possibly retaliatory - behaviours against an identifiable enemy. Possible examples are provided by Spielberg's *Saving Private Ryan*, albeit examples which fall into the problematic category of docu-drama as opposed to the straightforward category of fiction film (see Frame 3.6). At the end of the Omaha beach sequence, the American soldiers have gained the upper hand. Two German soldiers rise from a trench with their hands up and are shot down in cold blood. In the review of the film cited previously, Richard Williams observes that the viewer experiences a retaliatory reflex, effectively condoning the Americans' actions by 'pulling the trigger' along with them.

Following Damasio (ibid.), it is possible that the induction stage would involve the activation of several of the aforementioned sites - including the brain stem and the amygdala - but would not involve the 'intense' activation of either the hypothalamus or the ventromedial prefrontal cortex. From our perspective, however, the crucial point is that these sites - as subcortical entities - would be 'below' consciousness and therefore relatively insusceptible to our beliefs in the non-existence, or virtual status, of the characters in question (and the immoral nature of their actions). With respect to the response stage, we can make a two-fold distinction. The physiological component would be mediated by the sympathetic division of the ANS - responsible for energy expenditure - and possibly result in increased blood flow to the arms (and the 'trigger-finger') in preparation for retaliation. Given that this component would be both involuntary and invisible, it is possible that it would go largely uncensored. The main behavioural (or somatic) component, on the other hand, would be the physical activity of actual retaliation. Given that this component would be both voluntary and visible - and potentially cause considerable embarrassment - it would be subject to the social display rules described above.[20]

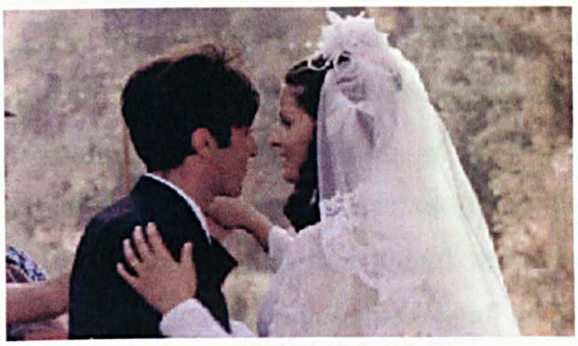
[20] Needless to say, viewers are not known for attacking the characters on the screen. Another example of a retaliatory reflex, however, can be found at the end of the film when Corporal Upham (played by Jeremy Davies) shoots a German soldier (Joerg Stadler). When I first saw the film, Upham's retaliation was accompanied by cheering and clapping in the cinema audience - possible instances of verbally, as opposed to physically, aggressive behaviours.

Figure 3.6: The primary emotion of anger

The final two primary emotions can be considered in tandem. Sadness is another example of a negative emotion, whereas happiness is the one and only example of a positive emotion; considering that both emotions are passive, they share certain similarities with disgust. Starting once again with the input stage, the most obvious examples of films designed to elicit sadness and happiness are provided by the melodrama (or 'tearjerker') and the romance / comedy genres (or the proverbial 'happy ending' to any classical film) respectively. Of course, individual scenes within any type of fiction film may elicit either sadness or happiness, archetypal examples being the scene of a crowd of people either mourning at a funeral or laughing and dancing at a wedding. An example of the latter is provided by Coppola's *The Godfather* from 1972 (see Frame 3.7): at a Sicilian wedding, the young Michael Corleone (Al Pacino) dances with his first wife Apollonia (Simonetta Stefanelli). (This example will be discussed in greater detail in Chapter 4.)

Following Damasio (ibid.), it is possible that the induction stage for sadness would involve both the activation of the brain-stem and the 'intense' activation of the hypothalamus and ventromedial prefrontal cortex. The induction stage for happiness, on the other hand, would involve the activation of a number of the aforementioned sites but in a different pattern. With respect to the response stage, the physiological components for both sadness and happiness would be mediated by the parasympathetic division of the ANS - responsible for energy restoration - though it is plausible that each emotion would be associated with a distinct pattern of parasympathetic activity. One of the main behavioural (somatic) components for sadness would be crying, whilst the behavioural components for happiness would include smiling and laughing. Although these components might be subject to both culture-specific and gender-specific display rules, it is not unknown for viewers to cry, or at least experience a moistening of the eyes. In conclusion, then, both sadness and happiness may rival disgust in terms of 'behavioural completeness'. In terms of 'emotional intensity', however, the sadness or happiness that the viewer may feel towards a filmic situation is unlikely to approach the sadness or happiness they would feel towards a real-world counterpart, whereas in the case of disgust, the difference between the viewer's response to an image and its real-world 'referent' may be negligible.

Frame 3.7: The primary emotion of happiness: *The Godfather* (1972)



(ii) Other response tendencies

It is intriguing that an emotion such as disgust is relatively immune to the paradox of fiction. Although some theorists question whether or not sexuality should be regarded as an emotion, a similar point can be made with respect to sexuality as an example of a 'response tendency'. Carroll (1990) assumes that sexual arousal does not require existence beliefs: 'If an attractive member of the sex of one's preference is described or depicted, desire will not be staunched by saying the description (or the depiction) is concocted.' (p.77) In a related fashion, Dawkins (1989, p.249) states: 'A man can be aroused … by a printed photograph of a woman's body. He is not 'fooled' into thinking that the pattern of printing ink really is a woman. He knows that he is only looking at ink on paper, yet his nervous system responds to it in the same kind of way as it might respond to a real woman.' Although many people might morally disapprove of the notion of a person being sexually aroused in the manner described, few people would have any conceptual difficulty with understanding such a scenario. The key question is why?

Dawkin's example captures the essence of the proposed solution to the paradox of fiction and can be applied to the erotic content of pornographic films (see Table 3.14). To begin with, it seems plausible that men are more visually aroused than woman: in this case, then, sexual arousal - like disgust - is primarily 'stimulus-driven' (see Fisher, 2004, p.82). According to the multi-level model outlined above, the man's visual system would produce the basic categorization, "A woman of such-and-such a description" as a shallow output, thereby telling his nervous system that an actual woman was present. The induction stage would involve the activation of 'sex circuits' in the brain stem and limbic system - i.e., those regions of the brain which are insusceptible to existence beliefs - whilst the resulting arousal would be mediated by the autonomic nervous system - i.e., that part of the nervous system which is beyond voluntary control. (See Shibley-Hyde and DeLamater 2000, Ch. 9, on the physiological underpinnings of sexual arousal.) Simultaneously, it is plausible that contextual (hippocampal) systems and cognitive (prefrontal) systems would produce the abstract categorization, "Audiovisual representation of a woman of such-and-such a description" as a deep output, thereby telling the nervous system that the sexual encounter was not a genuine one. It is plausible that this would result in the inhibition of the aforementioned circuits and a possible reduction in the overall level of arousal.

Table 3.14: The response tendency of sexual arousal

	(1) input stage (film genre)	**(2) induction stage (neural sites)**	**(3) response stage (physiology)**
sexual arousal	e.g., pornography	brain stem, limbic system	autonomic (sym. / parasym.)

In the case of pornographic films, the distinction between representation and referent is obviously significant. In a genre where an increasing majority of the action may be actual as opposed to staged, however, the distinction between fiction and non-fiction may be largely irrelevant. Nevertheless, the threshold model is of relevance in the manner described above. All other things being equal, the more graphic - and realistic - the depiction, the greater the likelihood that the 'threshold' of sexual arousal will be reached. (Given that films entail both movement and sound, they have the upper hand on still photographs.) In a related fashion, one could argue that pornographic films have exhibited a 'general trend' towards realism / salience. It is probable, furthermore, that this trend has been facilitated by the same set of positive constraints (re. film-making, film viewing, and film adjucation). With respect to technology, for instance, an improvement in cameras has allowed for the production of high resolution images at a relatively low cost. (In this respect, Grodal (1997, p.33) suggests that the 'flourishing pornographic industry' is based on the ''local' activation of perceptual cues'.) With respect to moral and legal constraints, on the other hand, it seems reasonable to say that a relaxation of socio-cultural attitudes regarding the depiction of sexually explicit subject-matter (primarily a moral issue) - in conjunction with the development of the internet (primarily a technological issue) - has resulted in a relaxation of the laws of film censorship (a legal issue), most obviously reflected by the shift from 'softcore' to 'hardcore' pornography.

CHAPTER 4

Developing a Multi-Level Model of the Emotion System: Tracing the Associative Network and Cognitive Appraisal Routes to (Cinematic) Emotion

CHAPTER 4

Developing a Multi-Level Model of the Emotion System: Tracing the Associative Network and Cognitive Appraisal Routes to (Cinematic) Emotion

4.1 INTRODUCTION

Although the neurobiological approach allows us to gain an understanding of the basic relationship between our perceptual, cognitive, and emotion systems (and the role of the body), whilst providing us with an overview of the input, induction, and response stages of the emotional process, it adheres to the classical conditioning paradigm by centring on the notion of an emotional stimulus (defined previously as a 'sensory object' with relatively strong emotional connotations). In the review of the 2002 book *Synaptic Self* cited previously, Fodor criticises LeDoux for 'working on a model for the brain that implements an associationist psychology'; a similar criticism could be levelled at the model described in LeDoux's 1998 book *The Emotional Brain*, which, though operating at a higher level of explanation, is based on the associative connections between emotional stimuli and (un)conditioned responses. Likewise, Damasio's (1999) lock and key analogy assumes that signals resulting from the perceptual processing of an emotional stimulus (the so-called 'key') activate 'emotion induction sites' which are 'preset' to respond to that particular class of stimulus (the 'lock'); in other words, the emotional impact of the stimulus can be explained in terms of the associative matching of a perceptual pattern with some sort of 'template' in the emotion system.

To what extent can our emotional lives - both inside and outside the cinema - be explained in these particular terms? This question brings us to a reconsideration of the *input stage* of the emotional process. To begin with, it should be acknowledged that the term 'emotional stimulus' is more inclusive than it at first appears: for instance, LeDoux (1993, p.111) claims that the amygdala is capable of responding to 'complex, socially relevant stimuli', whilst Damasio (1999, pp.56-59) stresses that he is referring to a 'range of stimuli' which includes both objects and situations. At this stage of the discussion, however, we must address two additional types of emotional elicitor. First, in contrast to individual (but relatively strong) emotional stimuli, we need to introduce the notion of *multiple* (but relatively weak) *emotion cues*. Treating a complex social situation (for example, a scene at a wedding) as an emotional stimulus in its own right fails to recognise that that situation may present a number of emotion cues at any given moment (people talking, smiling, laughing, dancing, a picturesque setting, background music, and so forth). A film-maker such as Coppola, furthermore, would be able to accentuate these emotion cues (through such devices as close-ups and lighting), whilst deliberately adding emotion cues from outside the world of the film (the most obvious example being non-diegetic music). Although this distinction is not necessarily a genuine concern for either LeDoux or Damasio, we need to be able to account for certain principles which are plausibly exploited by the film-maker: for instance, the greater the number of (congruent) emotion cues presented by a given film scene, the greater the likelihood of eliciting an emotional response in the viewer.

Second, in contrast to both emotional stimuli and cues as examples of 'sensory objects', we need to introduce the notion of *situational meaning* as an example of an 'abstract object'. Consider, for instance, the 'existential fears' which pervade our emotional lives. Many, if not all, of these fears can be thought of as relating to the various levels of Abraham Maslow's (1970) hierarchy of needs.[1] Although each of these needs may conjure up a multitude of mental images with salient perceptual elements, it is primarily their meaning (or implication) with respect to our goals and concerns which is of emotional significance. And because the process of appraising this meaning - and inducing appropriate emotional responses - cannot be satisfactorily explained in terms of the associative matching process described above, we are obliged to propose that our goals and concerns play some sort of causal role in the proceedings. Both LeDoux (2002, p.213) and Damasio (1999, p.59) acknowledge (at least indirectly) that their neurobiological accounts may not be able to explain the type of case in question. Unlike their failure to recognise the distinction between emotional stimuli and emotion cues, however, this acknowledgement constitutes a major admission which has not been given the weight it deserves.

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[1] From the bottom-up, these needs include the physiological (e.g., obtaining food, water, and oxygen), safety (e.g., finding security and receiving a steady financial income), belongingness and love (e.g., gaining acceptance and forming meaningful platonic / romantic relationships), esteem (i.e., gaining other people's respect), and self-actualization (i.e., realising our true potential).

(a) Multi-level models from cognitive film theory

Considering the potential limitations of the neurobiological account, how should we attempt to account for the impact of emotion cues and situational meaning? This question brings us to a reconsideration of the *induction stage* of the emotional process. In short, we need to develop a multi-level model of the emotion system which posits two routes to emotion: one based on an *associative network* (which is capable of dealing with emotion cues) and the other based on *cognitive appraisal* (which is capable of dealing with situational meaning). Given that our ultimate concern is cinematic emotions, are there any potential candidates from the field of cognitive film theory?

(i) The flow model

A small group of theorists have offered 'cognitivist' accounts of cinematic emotions. Torben Grodal (1997, 1999) describes the way in which we process a film's 'narrative flow'. In order to illustrate the basic stages of Grodal's *flow model*, let us return briefly to a film which he cites on numerous occasions: namely, Spielberg's *Raiders of the Lost Ark* (see Table 4.1). Consider, once again, the scene in which Indiana Jones is confronted by a rattlesnake. Moving in a 'downstream' direction, the first stage of the flow model would describe our perceptual processing of the filmic image: a visual analysis of the 'primal' and '2.5-D sketches' of the snake. In the second stage, a '3-D model' of the snake would be matched with a structural representation in memory; significantly, the process of memory-matching would coincide with the activation of corresponding 'affective labels' in an associative network. If the processing of the narrative flow ended there - as in the case of certain commercials and music videos - the scene would be described as 'lyrical-associative' in nature (and entail a *saturated* modal quality).

In most fiction films, however, the processing progresses to the third stage: at this point, we would cognitively appraise the scene for its emotional significance. Significantly, this process would require us to 'cognitively identify' with the character of Jones, thereby adopting his goals and concerns. (The process of 'cognitive identification' will be discussed in the following chapter.) The fourth and final stage comprises our emotional responses. If Jones took control of the situation and overcame the obstacle presented by the snake, our responses would operate in the *telic mode*: that is, we would experience voluntary, teleological (goal-directed) motor and cognitive activity (entailing a *tense* modal quality). If, on the other hand, he was unable to overcome the obstacles in question - that is, his goals were 'blocked' - our responses would operate in the *autonomic mode*: that is, we would experience involuntary emotional responses (entailing an *emotive* modal quality).

Although the second stage of the flow model corresponds to an associationist account of the emotions, whilst the third stage corresponds to a cognitivist account, at least two aspects of the model require clarification and elaboration. First, Grodal does not pay sufficient attention to the associative part of the process. Because he is primarily concerned with fiction films - featuring goal-oriented characters - he tends to focus on the role of cognitive identification. Second, although Grodal acknowledges that all of the stages may occur simultaneously, we need to make this point explicit, whilst spelling out additional relations between the various levels. In addition, one could argue that the modal quality is not simply dependent on either 'blockage' or 'flow'; rather, it also depends on the nature of the emotion cues presented and emotional appraisals performed, the type of emotion system activated, and the nature of the physiological, behavioural, and subjective responses elicited.

Table 4.1: The flow model (Grodal, 1997, 1999)

Stage 1: first visual analysis of primal or 2.5-D sketch
Stage 2: second visual analysis involving 3-D models and memory matching o lyrical-associative [mode] (*saturated* modal quality): associations 'saturated' with affect
Stage 3: cognitive appraisal
Stage 4: reactions o telic mode (*tense* modal quality): voluntary, teleological (goal/object-directed), motor/cognitive, sequential activity o paratelic mode (*emo-tense* modal quality): semi-voluntary, non-teleological (subject-centred), motor/cognitive, repetitive activity o autonomic mode (*emotive* modal quality): involuntary, autonomic responses

(ii) The associative network model

In a recent addition to the field of cognitive film theory, Greg M. Smith (2003) acknowledges the value of the 'cognitivist' accounts of filmic emotions advanced by Grodal and others.[2] He argues, however, that many emotional states do not fit the prototype in question: for instance, happiness inspired by a sunny day does not seem to have a precise object, whilst depression is not obviously functional. Drawing on a range of research from cognitive psychology and cognitive neuroscience, Smith proposes an *associative network model of the emotion system* in which 'multiple input channels' are linked to a system of 'emotion nodes' via a network of associative connections; the greater the number of 'emotion cues' presented to the input channels, the greater the likelihood that the corresponding emotion node will be activated. Although there are some 'universals' in the emotion system, different viewers in different cultures will build up different networks of associations through personal and sociocultural experience. Smith builds on this model by making a crucial distinction which has not been recognized by film theorists so far. Contrary to popular belief, empirical research suggests that emotions only tend to last for a matter of seconds or minutes. So how can we account for the apparent longevity of our emotional experiences? The answer lies in a set of 'orienting states' commonly known as *moods* which may persist for hours or even days. Significantly, Smith describes an interactive relationship between the two phenomena: moods incline us to experience certain emotions - by, for example, directing our attention to congruent stimuli in our environment - whilst emotions incline us to experience certain moods.

Given the short-lived nature of emotion, Smith proposes that a film's primary aim is to 'cue' moods in the viewer. In light of this aim, he introduces the *mood-cue approach* as a way of analysing the 'emotional appeals' of filmic texts. The emotion cues presented by film include: a character's facial, bodily, and vocal expressions; dialogue, sound, and music; and mise-en-scène, camera-work, and editing (p.42). In this respect, then, the importance of film style is acknowledged. Smith initially demonstrates the approach - and associated terminology - with a series of short analyses. Significantly, Spielberg's *Raiders of the Lost Ark* is described as a 'densely informative' emotional film; in order to establish and maintain the mood of fear and excitement, the opening sequence presents a series of 'emotion markers' - configurations of 'redundant' emotion cues - to elicit 'bursts' of the

[2] See Barratt (2004) for a more extensive discussion of Smith's book.

corresponding emotions. Forsyth's *Local Hero* (1983), on the other hand, is described as a 'sparsely informative' emotional film; considering its understated subject-matter, the film presents less redundant emotion cues - primarily of a comedic nature - although the pacing of emotion cuing changes as the film progresses.

Smith's recognition of the possibilities of the associative network and the significance of moods alone marks his project as a valuable contribution to the field of film studies. Having acknowledged the shortcomings of the prototypical view of emotion, however, Smith may go too far in the opposite direction when he claims that associations form the 'foundation' of all emotional phenomena (p.23). Although he refers to 'conscious thought' as another channel of processing (pp.30-31), he has little to say about the role that cognition plays in our emotional lives; for instance, the type of appraisal we might make when encountering the proverbial bear in the woods. When Smith talks about 'narrative situations' and 'emotion scripts' in the later sections, he seems to be referring to phenomena which cannot be accounted for in straightforwardly associative terms. In a related fashion, the term 'emotion cue' is occasionally used in an overly general sense; that is, to refer to any type of emotional elicitor. Considering these points, we need to integrate Smith's primarily associative approach with the more obviously cognitivist (and narrative-based) approaches of, say, Tan and Grodal, by developing a model which posits two principal routes to emotion - one based on associative networks, and the other on cognitive appraisal.

(b) Multi-level models from cognitive psychology

Given the potential limitations of both Grodal's flow model and Smith's associative network model, we need to find a multi-level model of the emotion system from the field of cognitive psychology which will provide us with a general framework for developing and integrating the associative network and cognitive appraisal routes to (cinematic) emotion.

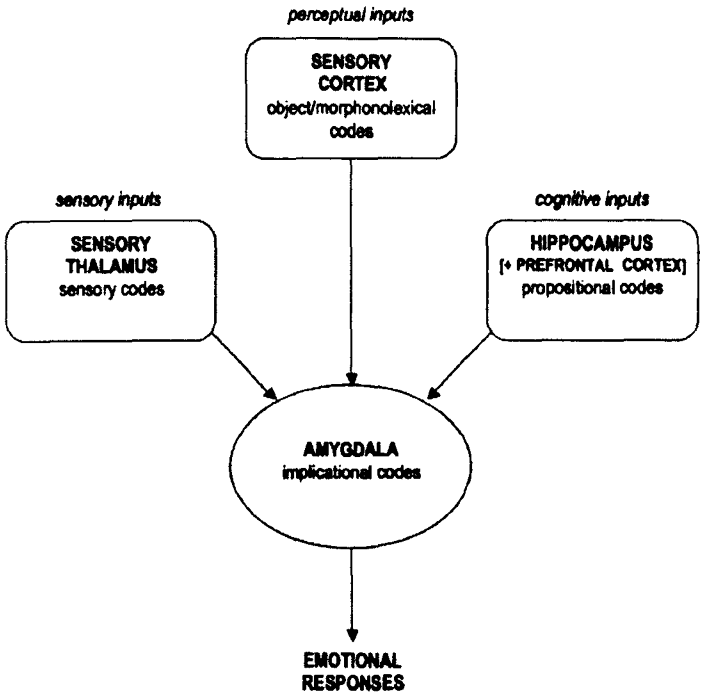
(i) The ICS approach

The first example of interest is the *Interacting Cognitive Subsystems* (ICS) approach advanced by Jon Teasdale and Phil Barnard (1991, 1993). ICS divides the mind into nine 'cognitive subsystems'. In the event of being confronted by an emotional situation - say, the proverbial snake - crude sensory data would be processed by the (1) Visual and (2) Acoustic subsystems. In turn, visual and acoustic codes would be 'parsed' by the (3) Object and (4) Morphonolexical (speech-level) subsystems to form representations of coherent, and nameable, objects. Significantly, Teasdale and Barnard only describe one principal route to emotion. The 'cold' and cognitive meaning of the situation would be assessed by the (5) Propositional subsystem, whereas the 'hot' and emotional meaning would be assessed by the (6) Implicational subsystem. Although propositional codes can be expressed by sentences in natural language, implicational codes cannot be expressed in linguistic terms: the transformation of the former into the latter involves a 'pattern-matching process' (i.e., it does not make reference to either goals or concerns). Finally, the (7) body state, (8) limb, and (9) articulatory subsystems would correspond approximately to the physiological, behavioural, and subjective components of emotion respectively.

In addition to introducing the importance of certain types of cognitive subsystem, the ICS framework provides us with a possible stepping stone between the neurobiological account of the emotion system outlined above and a more cognitive account to be outlined below. In a recent overview of multi-level theories, Teasdale (1999) attempts to combine the ICS framework with LeDoux's neurobiological account, thereby integrating cognitive and neurobiological 'levels of analysis' (see Figure 4.1). In particular, Teasdale suggests that the 'fast-acting' subcortical route in LeDoux's model corresponds to the transformation of sensory codes into implicational codes in ICS, whereas the 'slow-acting' cortical route corresponds to the transformation of 'higher-level' object, morphonolexical, and propositional codes into implicational codes. (To recap, Teasdale notes that '[i]t is striking that there is little mention of speech-level or propositional-conceptual processing in LeDoux's accounts'.)[3]

[3] May and Barnard (1995) apply the ICS framework to the case of film viewing and the perception of film editing.

Figure 4.1: Comparing the ICS approach with LeDoux's neurobiological account



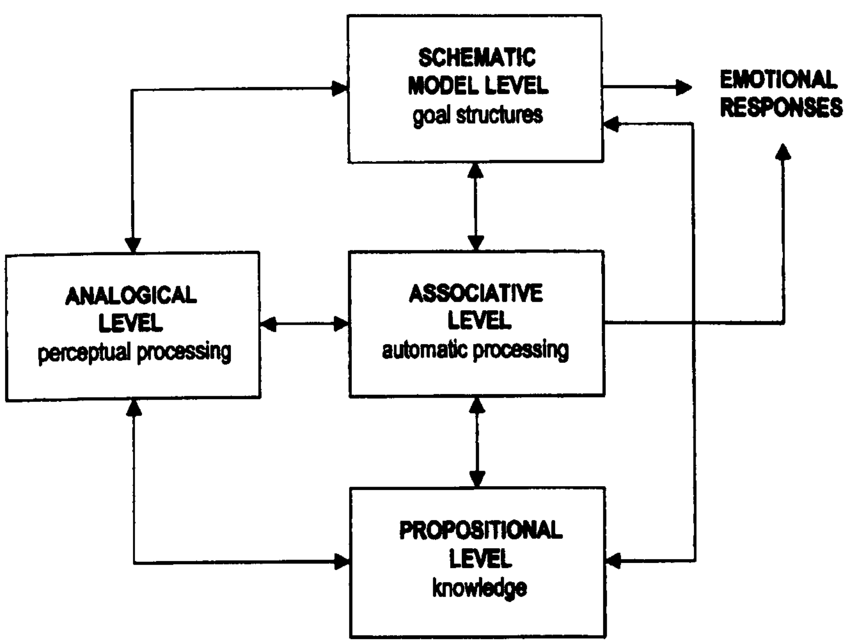
Inspired by Teasdale (1999).

(ii) The SPAARS approach

A second, and more recent, example of a multi-level model is the *Schematic, Propositional, Analogical, and Associative Representation Systems* (SPAARS) approach advanced by Mick Power and Tim Dalgleish (1997). SPAARS divides the mind into four basic levels (see Figure 4.2). The *analogical level* of the mind comprises the perceptual systems; it deals with representations (for example, visual and auditory images) which are analogous, in significant respects, to their 'referents'. The *propositional level*, on the other hand, contains information about the world and the self; it deals with representations which can be expressed by sentences in natural language. Following Teasdale and Barnard, the *schematic model level* integrates information from both of these levels with information relating to the subject's goals, thereby producing a 'schematic model' of the situation; this level is equivalent to the Implicational subsystem in ICS. Finally, the *associative level* of the mind consists of the associative connections between the three levels described; this level is involved in automatic, as opposed to controlled, processing.

Significantly, Power and Dalgleish describe two routes to emotion, involving different levels of the mind. The first route involves the schematic model level: the meaning of a situation is *cognitively appraised* with respect to the subject's goals and concerns, resulting in an appropriate emotional response. According to this view, emotions perform a functional role: the emotion of fear, for example, is related to the goal of self-preservation. The second route involves the associative level: in this case, an emotional event is linked to an emotional response by an *associative connection* (usually) established through past experience. (The second route is more automatic, and less functional, than the first.) In summary, the SPAARS approach is simpler than ICS on the one hand (in the sense that it divides the mind into four, as opposed to nine, systems), and more comprehensive than ICS on the other (in the sense that it proposes two routes, as opposed to a single route, to emotion).[4]

Figure 4.2: An overview of the SPAARS approach



Based on Figure 5.7 from Power and Dalgleish (1997), p.178.

* * *

[4] Eysenck and Keane (2000, p.494) compare the SPAARS framework with LeDoux's neurobiological account in relation to phobia: an inappropriate fear response could be initiated by the 'associative level', whilst correct beliefs - concerning the harmlessness of the phobic object - could be produced by the propositional and schematic model levels.

In brief, my aim in this chapter is to develop a multi-level model of the emotion system at a fine-grain level of analysis, thereby offering what could be described as a *secondary solution* to the paradox of fiction. Given the advantages of the SPAARS approach, I will adopt it as a basic framework for developing and integrating the associative network and cognitive appraisal routes to (cinematic) emotion. Although Power and Dalgleish assume that association is subsidiary to cognition, it is my intention to follow on from the neurobiological - and associationist - account outlined in the previous chapter, and to outline a multi-level model which begins with the simplest or 'lowest-level' associative processes, and ends with the most complex or 'highest-level' cognitive ones. In addition, the chapter will demonstrate how the second and fourth ways of seeing - namely, Darwinian modularity and conscious / attentive processing (regarding-as and seeing-as, type II) - may relate to the emotion system.

4.2 TRACING THE ASSOCIATIVE NETWORK ROUTE TO (CINEMATIC) EMOTION

(a) Another approach to (cinematic) emotion: the role of emotion cues

How should we go about tracing the associative network route to (cinematic) emotion? For a variety of reasons discussed above, fear is the prototypical emotion. And the prototypical example of a fear situation is being confronted by a threatening creature, be it a bear in William James's 1884 account of emotions, or a snake in Joseph LeDoux's 1998 example of walking along a woodland path. In order to allow for continuity - and to keep as many elements of the discussion constant as possible - we should stay with the prototypical emotion of fear and the prototypical example of being confronted by a threatening creature. In order to control the independent variables, however, we need to somehow remove the creature qua *emotional stimulus* from the emotion equation.

In short, we need a source of examples in which a character is confronted by a threatening creature but this creature is neither seen nor heard but *implied.* This example must present both *personal cues* - for instance, facial, bodily, and vocal expressions of fear - and *situational cues* - which tap into memories of some type of common experience. In addition, this example must present certain *non-diegetic cues* - the most obvious examples being provided by a musical score - thereby allowing us to introduce aspects of film style into the discussion; what is more, this music must be relatively simple so that we are able to understand it in layman's terms on the one hand, whilst relating it to both associative and cognitive processes on the other. What, then, is the archetypal example?

(i) A story about a shark

In 'Fearing Fictions', Kendall Walton (1978, p.10) only makes reference to one film example - namely, Steven Spielberg's *Jaws* (1975), a story about a Great White shark terrorising the community of Amity Island on the East Coast of America.[5] Walton states: '*Jaws* caused a lot of people to fear sharks which they thought might really exist. But whether they were afraid of the fictional sharks in the movie is another question.' How should we understand the status of the viewer's fear? And how should we understand the film's status as both a box-office and a cultural phenomenon?

In terms of its fear content, the basic structure of this two-hour film can be summarised as follows. The *first shark attack* occurs in the opening sequence. During a night-time gathering at the side of a beach, a young man and woman sneak away for a moonlight swim in the sea. Although the man Tom Cassidy (played by Jonathan Filley) collapses in a drunken stupor before he makes it to the water, the woman Chrissie Watkins (Susan Backlinie) dives in enthusiastically, calling back to Cassidy to join her. At this point, two underwater shots in conjunction with John Williams's famous musical score signal the shark's approach. Suddenly, Watkins is pulled under the water, screaming and thrashing her body from side to side. Meanwhile, Cassidy lies on the beach, completely oblivious to the horror which is happening out at sea.

The following morning, the local police chief Martin Brody (played by Roy Scheider) is alerted when the remains of Watkin's body are swept up on the beach. (In this scene, we catch a glimpse of the aftermath of the attack: Watkin's severed forearm is visible beneath a crawling pile of crabs.) Later that day, Brody sits in a deckchair, keeping watch. During this time, we are witness to two false alarms from his optical point-of-view: a black blob moving through the water which turns out to be a woman's swimming cap, and a girl screaming as she is lifted out of the water upon her boyfriend's shoulders. (Significantly, neither of these false alarms is accompanied by Williams's musical score.) Immediately afterwards, however, the *second shark attack* occurs. On this occasion, the

[5] The subsequent quotes from Steven Spielberg and John Williams are taken from the documentary 'The Making of *Jaws*': available on the Special 25th Anniversary Edition DVD of the film.

victim is a young boy: once again, a combination of underwater shots and musical score signals the shark's approach. (In this instance, we are allowed to see a contemporaneous consequent of the attack: namely, a fountain of blood rising from the sea.) Following the second attack, Brody seeks the help of a young marine biologist called Matt Hooper (played by Richard Dreyfuss), allowing him to analyse Watkin's remains. (During the post-mortem, we catch another glimpse of Watkin's severed forearm and we hear Hooper's graphic description.) Later that day, the two men unwittingly stumble upon the aftermath of the *third shark attack*: in an attempt to locate a local fisherman who may be able to help them kill the shark, Hooper discovers the fisherman's body in the wreckage of his boat. During the subsequent Fourth of July celebrations on the island, we are witness to a third false alarm: as a prank, two boys construct a shark fin out of a piece of cardboard. (Once again, this false alarm is not accompanied by Williams's musical score.)

After one hour of screen time, the *fourth shark attack* occurs: for the first time, we see the shark's fin and we catch a glimpse of the shark's head and body as it attacks a male swimmer in the estuary. (In this instance, we are allowed to see clouds of blood and the man's severed leg falling to the seabed.) The fourth attack prompts Brody and Hooper to seek the help of an old shark hunter called Quint (Robert Shaw). The three set sail in Quint's boat, the 'Orca', in a final attempt to rid the island of the shark. After eighty minutes, we catch our first proper sight of the shark as Brody throws bait into the sea; a genuinely shocking moment which prompted Scheider's adlibbed line to Shaw, "You're gonna need a bigger boat." (see Frame 4.1). (Paradoxically, this sighting occurs in the absence of Williams's musical score.) In the final ten minutes of the film, we witness the first direct confrontations between human and shark. Hooper faces the shark in an underwater cage, whereas Brody undergoes his ordeal in the water-filled cabin of the sinking boat. Quint is the ill-fated one of the three, practically bitten in half as he is pulled under the water, screaming and spewing blood.

Frame 4.1: A story about a shark: *Jaws* (1975)

In summary, for at least the first two thirds of the film, the shark as an emotional stimulus is conspicuous in its absence. The only scenes which correspond to the prototypical examples of fear situations - as described by both James and LeDoux - occur at the film's conclusion. Why is this so? Spielberg offers two reasons for the shark's absence. The first reason is based on practical considerations: for instance, the life-size replica of the shark constructed for the film was not working for much of the film's production. The second reason is of more significance to the project in hand. In order to outline this reason, it will be necessary to turn briefly to the original novel by Peter Benchley. In the opening chapter, Benchley provides a detailed description of the first shark attack involving the Watkins girl:

> [1] The fish was about forty feet away from the woman, off to the side, when it turned suddenly to the left, dropped entirely below the surface, and with two quick thrusts of its tail, was upon her.
>
> [2] At first, the woman thought she had snagged her leg on a rock or a piece of floating wood. There was no initial pain, only one violent tug on her right leg. She reached down to touch her foot, treading water with her left leg to keep her head up, feeling in the blackness with her left hand. She could not find her foot. She reached higher on her leg, and then she was overcome by a rush of nausea and dizziness. Her groping fingers had found a nub of bone and tattered flesh. She knew that the warm, pulsing flow over her fingers in the chill water was her own blood.

These representative paragraphs provide two possible sources of horror. In the first paragraph, we are provided with a description of the shark (qua emotional stimulus), whilst in the second paragraph, we are provided with a graphic description of the girl's injuries. In reference to Benchley, Spielberg acknowledges that showing the shark would have produced a spectacular opening to the film, but argues that it would have been a 'monster moment' that we have all seen before - interestingly, the sort of moment to which Walton, presumably, is referring. In contrast, Spielberg states that he felt that it would be more effective *not* to show the shark. Presumably, similar remarks could be made about his choice to refrain from showing us the girl's injuries (although this choice might have been subject to censorial, as well as aesthetic, constraints). Instead, Spielberg chooses to depict the shark attacks either by presenting us with an array of contemporaneous emotion cues, or by allowing us to catch glimpses of the aftermath (notably, the girl's severed forearm).

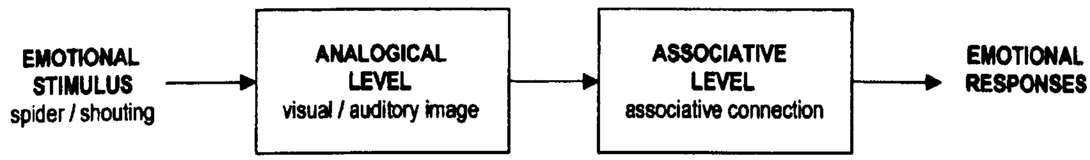
In this respect, Spielberg follows the type of wisdom espoused by Hitchcock during his making of *Psycho* (1960); a wisdom which states that what a film *doesn't* show the viewer is as important as what it *does* show. Indeed, the notorious shower scene in which Marion Crane (Janet Leigh) is attacked by an unknown assailant will serve as a useful point of comparison in the following discussion. Although Hitchcock allows us to see the attacker, he keeps these sightings to a minimum, framing the attacker in silhouette and quickly cutting away. Contrary to first impressions, moreover, we never actually see the knife piercing Marion's flesh. Once again, then, the emphasis is placed on contemporaneous emotion cues.

(ii) The role of association in SPAARS

How should we understand the associative level of the mind? Power and Dalgleish (1997) cite two types of example (see Figure 4.3). First (from our perspective), certain associations have been established - or 'biologically prepared' - over the course of human evolution. The authors cite the example of Julia finding a spider in a kitchen cupboard and responding with fear (p.183). Such an encounter would begin with the *analogical level* of the mind: that is, the perception of the spider. Because spider fear has been 'biologically prepared', subsequent encounters with spiders would generate fear via an associative connection.

Second (and most significant from Power and Dalgleish's perspective), certain associations become established during the course of an individual's lifetime. The authors cite the example of Peter who, as a child, was shouted at by his father (p.176). Originally, the event of the father shouting would have inspired a cognitive appraisal of the situation, resulting in the emotions of fear and anger. After repetition, however, the sound of shouting would become associatively connected with the emotions in question. In summary, both of the examples conform to the classical conditioning paradigm described above: for instance, a spider can be regarded as what LeDoux would describe as an unconditioned (visual) stimulus or 'natural trigger', whilst the sound of a person shouting can be regarded as a conditioned (auditory) stimulus or 'learnt trigger'.

Figure 4.3: The associative level route to emotion



(b) Understanding the associative level of the mind [6]

How should we develop our understanding of the associative level of the mind? Although Power and Dalgleish only describe examples with *single* associative connections, they suggest two important avenues of enquiry which may help us to develop a more *network-based* route to emotion. It is to these two avenues that we now turn.

(i) Associative networks

The first avenue of enquiry can be thought of as a precursor of the classical conditioning paradigm: namely, the associative network. This tradition can be traced back to the British empiricists: for instance, David Hume (1748, p.24) proposed that the 'association of ideas' is based on three types of relation - namely, '*Resemblance*, *Contiguity* in time and place, and *Cause and Effect*'. (The classical conditioning paradigm - advanced by the behaviourists Ivan Pavlov, James Watson, and B. F. Skinner - replaced ideas with reflexes.)

Power and Dalgleish (1997, p.174) suggest that the associative level bears some resemblance to Gordon Bower's (1981, 1982) associative network model of memory and

[6] For a recent discussion of associative network theories of emotion, see Forgas (1999).

emotion, although they do not develop this comparison in any detail. In short, Bower proposes that emotions are encoded (in propositional form) as nodes in an associative network 'stored' in long-term memory (see Figure 4.4). An *emotion node* is connected to associated concepts, memories, behavioural expressions, and physiological patterns. In addition, different emotion nodes are connected to each other by either excitatory or inhibitory connections: for instance, the connection between the fear node and the anger node might be excitatory, whilst the connection between the fear node and the happiness node might be inhibitory. The associative network model is used to explain the relationship between affect and cognition. In a typical experiment, the process allegedly begins with the activation of an emotion node: either a positive or a negative mood is induced in the subject. (An emotion node can be activated by either external or internal stimuli. Interestingly, one of the methods of mood-induction is showing the subject a happy or sad film.) Subsequently, activation 'spreads' from the emotion node to, for instance, associated 'memory structures' or *event nodes*, bringing these nodes to a state of 'subthreshold excitation'. This model yields hypotheses about *mood congruity* and *thought congruity*: people in good moods tend to recall positive memories and think positive thoughts, whilst people in bad moods tend to recall negative memories and think negative thoughts.

From our perspective, two properties of the associative network model are of interest. First, the model gives us an idea of the general architecture of a network: in particular, the notion of an emotion node associatively connected to a number of other states. In the case of film viewing, however, we need to approach the model from the opposite direction, as it were: viz., we are interested in how the activation of the states in question - connected, directly or indirectly, with what we have seen or heard on screen - results in the activation of an emotion node, thereby increasing our chances of responding emotionally. To put it another way, we are concerned with the effects of perceptual and cognitive associations on emotion rather than with the effects of emotion on perceptual and cognitive associations. Significantly, the connections between nodes are bi-directional: considering that an emotion node cannot be activated directly, we should think of the states in question as *input nodes.*[7] Second, Bower implies that an associative network is capable of dealing with multiple emotions cues: the greater the number of (congruent) emotion cues presented - i.e., the greater the number of nodes that 'light up' in the network - the greater the likelihood that the corresponding emotion node will be activated.

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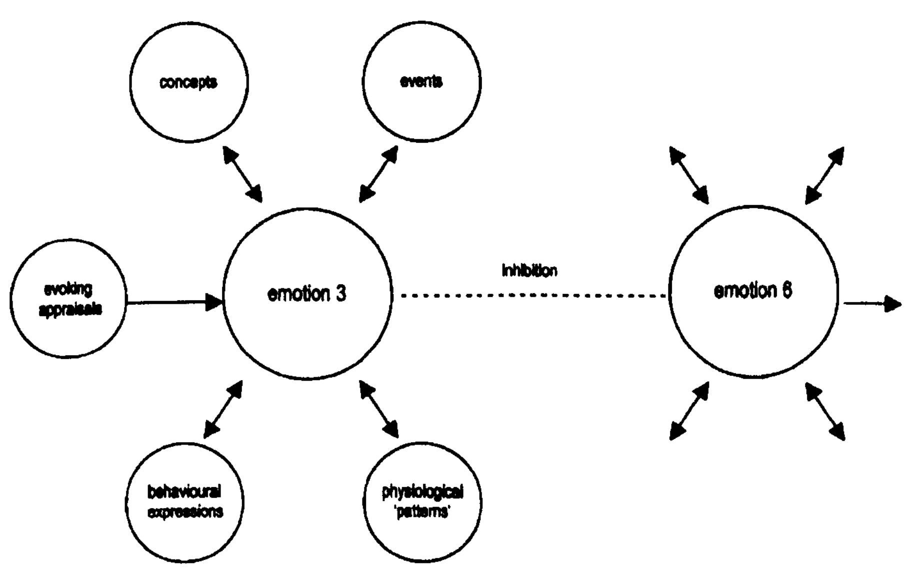
[7] Presumably, when films are used as a means of inducing moods, these films must access the emotion node via input nodes - to my knowledge, this point is not made explicit in the literature.

It should be acknowledged that certain aspects of Bower's associative network model of memory and emotion are problematic. Many of these problems concern experimental limitations (the failure to repeat the results of the original experiments on mood congruity, and so forth). Considering that we are concerned with the general implications of the associative network model, these problems will not concern us. It is necessary, however, to acknowledge some of the theoretical limitations. The first set of limitations stems from the *propositional nature* of the proposed network. Power and Dalgleish (ibid., p.74) state, for instance, that 'a theory that gives emotion the same status as words or concepts is theoretically confused'. (Other theorists argue that the notion of an 'emotion node' is problematic - see Berkowitz, 2000, p.124.) As we will see, these problems will be solved by spelling out the network in connectionist (and neurobiological) terms. The second set of limitations stems from the *uni-level nature* of the proposed model. Power and Dalgleish suggest that the model requires a higher level of representation in order to organise the information encoded in the network. (Other theorists point out that Bower's network relies on 'passive' associations rather than 'active' cognitions.) These problems will be solved by placing the network into a multi-level model of the mind in which the 'passive' associative network route to emotion runs alongside a more or less 'active' cognitive appraisal route.

Figure 4.4: Bower's (1981) associative network model of memory and emotion



(ii) Connectionist networks

The second avenue of enquiry can be thought of as a modern-day version of the associative network. Considering some of the theoretical limitations discussed above, Power and Dalgleish (1997, p.112) propose that associative network models should be replaced with 'the emergent properties of massively parallel distributed process networks' but concede that 'the types of PDP networks currently available may need to be substantially modified before an adequate theory is achieved'. Nevertheless, we need to push the discussion in this direction in order to gain a reasonable idea of what such a model might look like.

A PDP network is also known as a *connectionist network* (see Rumelhart, McClelland, and the PDP Research Group, 1986).[8] The basic properties of a connectionist network can be summarised as follows (see Figure 4.5). A node is analogous to a neuron, or a group of neurons; individual nodes are linked to each other by weighted connections which are analogous to either excitatory or inhibitory synapses. The nodes in a connectionist network are typically organised into three layers: an input layer, a hidden layer, and an output layer. The presentation of a stimulus pattern will produce a 'pattern of activation' in the nodes of the input layer. The value of the input from an 'input node' (I) to a 'hidden node' (H) is equivalent to the level of the activation at I multiplied by the weight of the connection between I and H. The hidden node will effectively sum the inputs, and if the 'net input' exceeds a certain threshold - as determined by an activation function - it will send activation to the output nodes, and so on.

A consideration of two types of connectionist network in particular provides us with an alternative way of understanding (the impact of) the first way of 'seeing' described in Chapter 2 under the rubric of 'Fodorian modularity' and shallow outputs. From our perspective, a *pattern recognition network* is capable of recognizing a single type of pattern: for instance, it receives a stimulus pattern as an input and produces a basic category as a (shallow) output. Significantly, the term 'pattern' need not refer to either a visual or a static phenomenon: in theory, a pattern can be presented by any sensory modality, including the auditory and the somatosensory, whilst displaying the type of changeability exemplified by a piece of music. In contrast, a *pattern association network* is capable of associating one type of pattern with another: for instance, it receives a stimulus

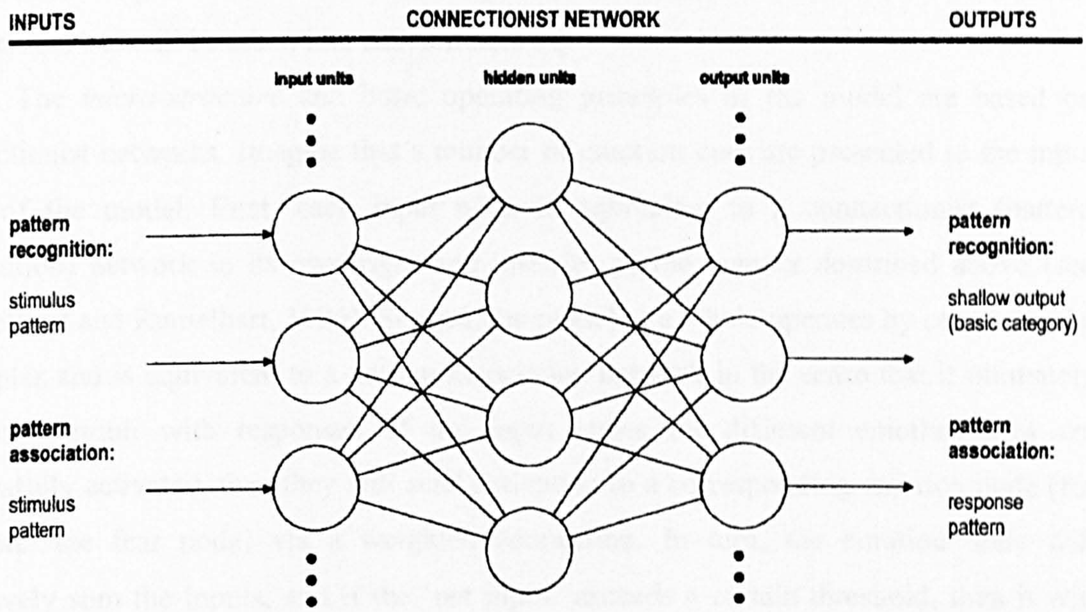
[8] For a more recent discussion, see McLeod et al. (1998), especially Chapters 1 and 3. An overview of connectionism is provided by Pinker (1997) and Hogan (2003).

pattern as an input and produces a response pattern as an output. According to the *Hebb Learning Rule*, if both the stimulus and response patterns are 'presented' to the network simultaneously, then the weight of the associative connection between the two is strengthened; subsequently, the presentation of the stimulus alone may be sufficient to elicit the corresponding response. (The most obvious example of Hebbian learning is Pavlov's dogs learning to associate the sound of a bell ringing with a salivatory response.)[9]

Both stimulus and response patterns are encoded in a connectionist network in terms of *distributed representations*: that is, the relevant information is stored in the weights of the connections between individual nodes. (The notion of distribution implies that more than one representation can be stored across the same network.) The processes of pattern recognition and pattern association can be understood in terms of *parallel constraint satisfaction*: that is, the network settles on those representations which satisfy the greatest number of constraints (see Thagard, 1996, Ch. 7; Thagard and Verbeurgt, 1997). Distributed representations have a number of important properties: they are 'content-addressable' (being presented with any aspect of the stimulus may be sufficient to reinstate the entire memory); they are capable of dealing with 'noisy' information (read: projected, potentially degraded two-dimensional images); and they 'generalise' when presented with new information (i.e., sights and sounds which are similar, but not identical, to those encountered through prior experience).

[9] In a strict sense, a pattern recognition network could be classified as an example of a pattern association network: viz., it learns to associate a stimulus pattern (qua input pattern) with a basic category (qua output pattern). The distinction between the two networks is largely a pragmatic one, intended to reflect the different nature of the corresponding tasks.

Figure 4.5: Connectionist network: pattern recognition / pattern association



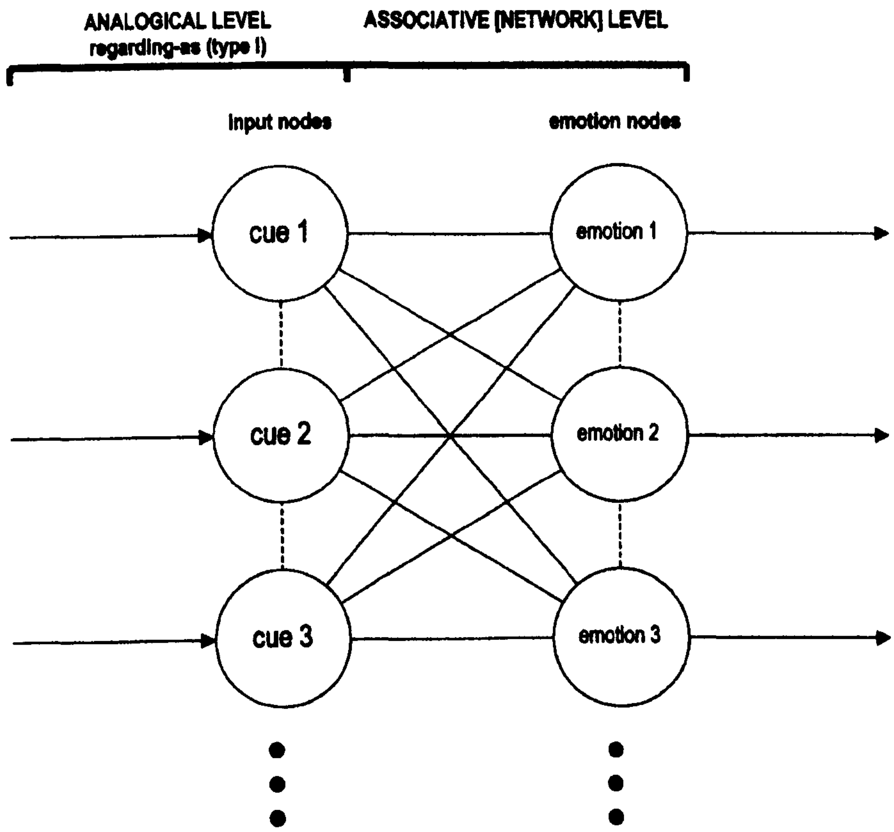
(c) Illustrating the model

Having considered associative and connectionist networks, we are in a position to propose a model of the associative network route to (cinematic) emotion (see Figure 4.6). According to the proposed model, the *analogical level* of the mind can be thought of as comprising a number of different 'input nodes': this way of thinking provides us with an alternative way of understanding the notion of 'regarding-as (type I)' with respect to perception. Correspondingly, the *associative level* can be thought of as comprising the associative connections to related 'emotion nodes': this way of thinking provides us with another way of understanding regarding-as (type I) with respect to emotion.

The *macro-structure* of the model is based on an associative network. This time, the input nodes are lined up on the left-hand side for ease of representation (and to facilitate comparison with connectionist networks). Moving from left to right, the input nodes for different emotion cues are located in their respective sensory modalities: for instance, the visual, the auditory, and the somatosensory. Each of the lines represents a weighted connection; some of these connections have been 'biologically prepared' over the course of human evolution, whilst others - possibly the majority - are established during the individual's lifetime through socio-cultural experience. An emotion node is approximately equivalent to the emotion-induction sites - for example, the amygdala - described in Chapter 2. (For the sake of simplicity, event nodes have been omitted from the basic model but will be taken into account below.)

The *micro-structure* and basic operating principles of the model are based on connectionist networks. Imagine that a number of emotion cues are presented to the input layer of the model. First, each input node is equivalent to a connectionist (pattern recognition) network in its own right and operates in the manner described above (see McClelland and Rumelhart, 1986). Second, the model as a whole operates by connectionist principles and is equivalent to a pattern association network in the sense that it ultimately connects stimuli with responses. If the input nodes for different emotion cues are successfully activated, then they will send activation to a corresponding emotion node (for example, the fear node) via a weighted connection. In turn, the emotion node will effectively sum the inputs, and if the 'net input' exceeds a certain threshold, then it will produce an output; i.e., it will send activation to the nodes (or brain systems) which generate emotional responses. In summary, the model provides us with a possible explanation for how the emotion cues described by Greg M. Smith (2003) actually operate on the mind of the viewer, both individually and collectively.

Figure 4.6: The associative network route to (cinematic) emotion



(i) Diegetic cues

How should we attempt to classify emotion cues? Although the input nodes for different emotion cues may be located in their respective sensory modalities, from the perspective of film viewing we may have to rely on a more artificial way of carving up the world. The category of *diegetic cues* can be used to refer to emotion cues which are presented from inside the world of the film. These cues can be divided into two sub-categories.

□ *Personal cues*

How should we understand the *personal cues* presented by fiction film? In terms of perceptual salience, the first type of personal cue is provided by a character's *face*: the most obvious examples of facial cues are facial expressions of emotion. In the opening sequence of Spielberg's *Jaws*, the Watkins girl displays facial expressions of surprise and fear at the beginning of the attack, and facial expressions of pain and fear towards the end. These expressions are especially salient in the final close shot, as the girl is pulled under the water (see Frame 4.2a). An alternative example is provided by the shower scene from Hitchcock's *Psycho* in which Marion Crane (Janet Leigh) is attacked by an unknown assailant (see Frame 4.2b): one could argue that the well-known publicity frame still of Leigh's face provides us with an archetypal example of the facial expression of fear.

Frame 4.2a: Diegetic (personal) cues: *Jaws* (1975)

Frame 4.2b: Diegetic (personal) cues: *Psycho* (1960)

How do the facial expressions in question *communicate* emotion on the one hand, and *elicit* emotion on the other? In order to answer this question, a brief and selective historical overview will be necessary. In a famous experiment by Kuleshov, three identical shots of the actor Ivan Mozhukhin's inexpressive face were attached to shots of a plate of soup, a man's corpse, and a half-naked woman (for a good summary, see Mitry, 1998). Legend has it that the audience interpreted Mozhukin's facial expressions as conveying hunger, pain, and desire respectively, whilst marvelling at the quality of his performance. The so-called 'Kuleshov effect' allegedly demonstrates that facial expressions are 'emotionally amorphous', and that, therefore, our interpretation of such expressions is dependent on the *emotional context* alone. Carroll (1996) argues against the Kuleshov view but resists the temptation to go to the opposite extreme; instead, he proposes that the close-up of a character's face establishes an 'emotional range', whilst the context - provided by a POV shot or the narrative situation - provides an 'emotional focus'.

Carroll's notion of the face as a reliable 'range finder' is supported by Paul Ekman's two-factor *neurocultural model* of facial expressions. Ekman proposes that there are distinct (cross-cultural) facial expressions for each of the primary emotions: namely, fear, disgust, surprise, anger, sadness, and happiness. According to the first factor of the model, a facial expression is a 'read-out' of a primary emotion ('facial effect programs'). In this respect, Ekman and Friesen (1978) have developed the *Facial Action Coding System* (FACS) which enables trained researchers to identity each of the muscle units (MUs) and action units (AUs) underlying every 'visually distinguishable facial movement' (see Table 4.2). According to the second factor, on the other hand, such expressions can be over-ridden by the type of cultural display rule described previously. In contrast to Ekman's neurocultural model, Alan Fridlund (1994) proposes a *behavioural ecology view* of facial expressions which stresses the importance of context and (intentional) communication - a view which harks back to Kuleshov's original experiment.[10] Upon showing Fridlund the frame still from *Psycho*, he pointed out that it also depicts the kind of facial expression an athlete might display if they had just won a marathon; in other words, the specificity of facial expressions is overridden by the primacy of context.

Table 4.2: Facial cues: the Facial Action Coding System (FACS)

AU number	FACS name	muscular basis
1	inner brow raiser	*frontalis, pars medialis*
2	outer brow raiser	*frontalis, pars lateralis*
4	brow lowerer	*depressor glabellae; depressor supercilii; corrugator*

[10] Thanks to Alan Fridlund, Department of Psychology, UCSB, for a number of discussions about facial expressions of emotion in film.

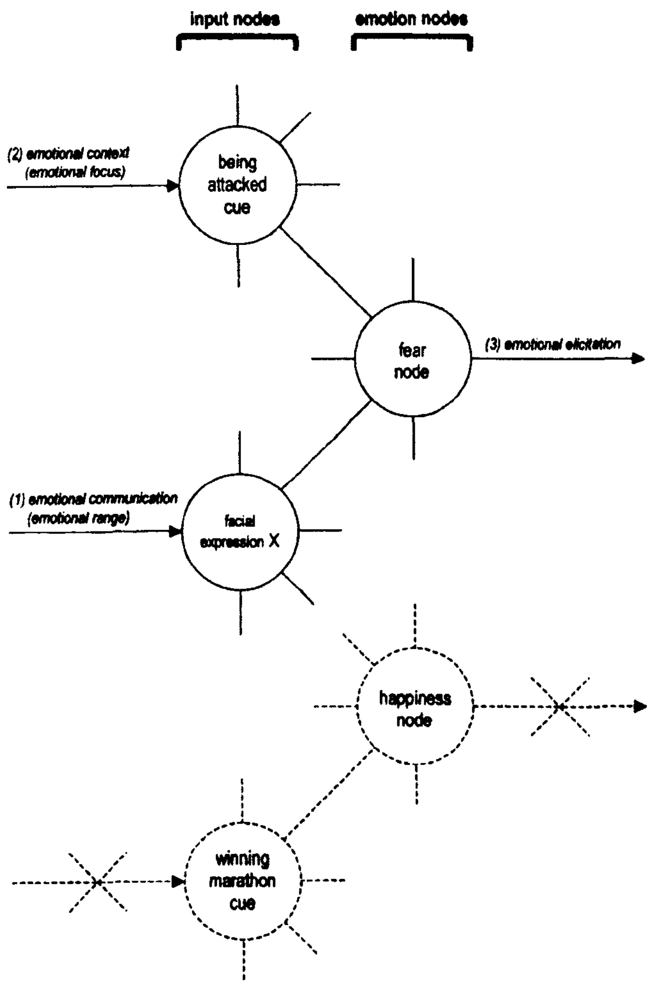
This overview raises three main questions. The first question concerns the process of *emotional communication*. Given that there may be a 'facial affect program' for the display of an emotion, is there a corresponding program for the recognition of such a display? One could argue that the existence of a 'recognition program' is implicit in Ekman's neurocultural model: for instance, what would be the point of having universal displays if there was not universal recognition as well? Surprisingly, Ekman (2003, p.219) is noncommittal on this issue, stating that our recognition capacity may be either innate ('operating from preset instructions') or learnt during our formative years. The second question concerns the process of *emotional context*. Following Ekman and Fridlund's dispute, what role does context actually play? According to one extreme, it plays a primary role; according to the other, it merely plays a secondary, or qualifying, role. The third and final question concerns the process of *emotional elicitation*. In short, how does the activity of observing another person's facial expressions generate an emotional response?

Possible answers to all three questions are provided by the neurobiological account outlined in the previous chapter: for instance, LeDoux (2002, p.220) suggests that the amygdala plays a role in both the recognition and emotional appraisal of facial expressions of fear, whilst the hippocampal formation plays a role in the processing of contextual information. More conclusive, or sophisticated, answers, however, may be provided by the associationist (connectionist) account currently under consideration (see Figure 4.7). This account may allow us to support the theories of both Ekman and Carroll on the one hand, whilst explaining the role of context described by Fridlund and Kuleshov on the other. Say that we observe the facial expressions of the Watkins girl in *Jaws* or Marion in *Psycho*. For the sake of argument, let us describe Watkin's and Marion's facial expressions as comprising a particular combination of muscle and action units - call it 'combination X'. And let us assume that Ekman would claim that facial expression X displays the primary emotion of fear, whilst Fridlund would argue that, in different circumstances, facial expression X might display the aggressive triumph of a victorious athlete.

First, with respect to emotional communication - and the establishment of an 'emotional range' - the 'input node' for the recognition of facial expression X may be equivalent to a connectionist (pattern association) network in its own right: recall that such networks may be capable of dealing with patterns of considerable complexity and subtlety.[11] What is more, although X may be associated with a variety of emotions (in accordance with Fridlund's view), it is plausible that the connections between X and the 'fear node', are more heavily weighted - through either 'biological preparedness' or learning - than those connections between X and, say, the 'happiness node' (pro Ekman). Second, with respect to emotional context - and the establishment of an 'emotional focus' - an associative (connectionist) network may be capable of taking various types of context into account. If, for instance, facial expression X occurs in conjunction with a cue which specifies that a person is being attacked - as opposed to, say, winning a marathon - then the fear node will be activated to a greater extent than the happiness node, thereby identifying X as a display of fear as opposed to one of triumph. Third and final, emotional elicitation can be explained in terms of the fear node exceeding a certain 'activation threshold' and, consequently, sending activation to the nodes (or brain systems) which generate fear responses.

[11] A connectionist model for facial expression recognition is described by Lisetti and Schiano (2000), section 3.2.2. Figure 1 depicts a simple network with an input layer - comprised of nodes for face, brow/forehead, eyes/lids, and mouth/nose/chin - and corresponding hidden and output layers.

Figure 4.7: Diegetic (personal) cues: the role of emotional communication, context, and elicitation



The second type of personal cue is provided by a character's *body*. Bodily cues can be broken down into two basic categories: namely, instrumental and expressive behaviours (see Table 4.3). In the middle of the shark attack in *Jaws*, the Watkins girl's facial expressions are largely obscured by splashing water; therefore, her bodily behaviour has the highest degree of salience. This behaviour is primarily instrumental in nature: the girl thrashes her body from side to side (an example of a fighting behaviour), and, at one point, she grabs hold of a buoy in an almost hug-like embrace (a possible example of a coping behaviour). It is plausible that the expressions in question will be associated with the emotion of fear, and that our viewing of such expressions would result in the activation of the fear node. In addition, Spielberg states that he wanted the girl's 'violent jerking motions' to 'trigger our imagination' about what is happening below the surface of the water. (These motions serve as an indirect indication of the size and strength of the shark.) Similar remarks can be made about the shower scene from *Psycho*. With respect to instrumental behaviours, Marion attempts to shield her body with her hands, an example of a defensive behaviour. Given that Hitchcock refrains from showing us the face of Marion's attacker - and given that we never actually see the knife piercing Marion's flesh - much is left to the proverbial imagination; Marion's bodily expressions serving as important prompts in the imaginative process. (The notion of imagination and its relation to appraisal will be discussed in greater detail below.)

Table 4.3: Bodily cues: instrumental and expressive behaviours

	basic examples
(1) instrumental	approach / withdrawal: fight / flight
(2) expressive	postural, gestural

Moving from the visual modality to the auditory, the third type of personal cue is provided by a character's *voice*: the most obvious examples of vocal cues are vocal expressions of emotion. In the opening sequence from *Jaws*, the Watkin girl's vocal expressions of fear are audible beneath Williams's musical score. (Similarly, in the shower sequence from *Psycho*, Marion's screams are audible beneath Herrmann's musical score.) Although there is no vocal equivalent of Kuleshov's experiment - at least in the field of film theory - the story of the face's emotional status can be adapted with respect to the voice. From a filmic perspective, it is plausible that the sound of a character's vocal expressions of emotion establish an 'emotional range', whilst the context - provided by a POV shot or the narrative situation - provides an 'emotional focus'. Similarly, the notion of the voice as a reliable 'range finder' can be supported by the findings of psychology.

What Ekman is to psychological research on the face, Klaus Scherer is to psychological research on the voice (see Scherer, 1993; Scherer and Johnstone, 2000). Whilst Ekman acknowledges that there are likely to be distinct (cross-cultural) vocal expressions for each of the primary emotions, it is Scherer who describes the 'perceptual dimensions' associated with the emotions in question (see Table 4.4). It is plausible that both Watkin's and Marion's vocal expressions comprise some of the perceptual dimensions associated with fear. (In addition, human (and animal) screams may act as natural and/or learnt fear triggers.) Conversely, Fridlund might argue that our interpretation of such vocal expressions is primarily dependent on context. How many times, for instance, have we started at the sound of a person's scream, only to realise a few seconds later that the cause of our alarm is actually a shriek of delight? As in the case of the face, a consideration of the emotional impact of the voice raises three main questions, regarding the processes of emotional communication (range-finding), emotional context-assessment (focusing), and emotional elicitation. Although answers can be provided by the neurobiological account - the amygdala playing a prominent once again - a more sophisticated account may be provided by the associationist (connectionist) model outlined in Figure 4.7. Given that input patterns can be auditory as well as visual, simply replace the input node for 'facial expression X' with one for 'vocal expression X'.

Table 4.4: Vocal cues: perceptual dimensions

	acoustic variable	**measure**
(1) loudness	intensity	decibel (dB)
(2) pitch	fundamental frequency (*F°*)	hertz (Hz)
(3) time	duration	second (sec)

The fourth and final example of a personal cue is provided by the *dialogue* spoken by a character. Certain verbal cues - i.e., words and phrases - may have emotional salience in their own right; that is, independently of vocal delivery and semantic content. The opening sequence of *Jaws* presents a number of potential examples: for instance, as the Watkins girl is pulled under the water (see Frame 4.2a), she screams "Oh my God!" and "God help me!" How should we understand the emotional impact of such exclamations? Experiments on *perceptual defense* demonstrate that subjects take longer to recognize so-called 'taboo' words - for example, sexual swear words - than they do neutral words (see LeDoux, 1998, p.56). This result is typically explained, however, in terms of the Freudian notion of 'repression'. A more promising line of enquiry lies in what has come to be known as the *emotional stroop task* (see Figure 4.8). In this task, the subject is presented with lists of words and asked to name the ink colour of the word rather than read the word itself. Investigators find that subjects tend to take longer to name the ink colour of emotional words (like 'fear'), as opposed to neutral words (like 'table'). Although the emotional stroop task involves 'seeing' words rather than 'hearing' them, the impact of emotional words can be explained in associative (connectionist) terms.[12] The words/phrases uttered by the girl have strong associations with the emotive subjects of religion, blasphemy, and helplessness.

Figure 4.8: Emotional stroop task

table

fear

□ *Situational cues*

Any given situation in a film presents a number of *situational cues* which are capable of activating corresponding perceptual representations in the input layer of an associative network. In the opening sequence of *Jaws*, the sight of the sea would result in the activation of the input node for 'sea', whilst the sight of a person swimming would result in the activation of the input node for 'swimming' (see Frame 4.3). Given the obviously tautological nature of such statements, however, let us use a consideration of situational cues to illustrate another aspect of the associative network model. One explanation for the phenomenal box office and cultural success of *Jaws* is that it taps into readily available *autobiographical* or *episodic memories* of universal experiences. Although very few of us have been in the sea with a shark, Spielberg points out that most of us have been swimming. (A similar argument could be made with respect to *Psycho*, perhaps, by citing the commonplace activities of checking into a motel and taking a shower.)

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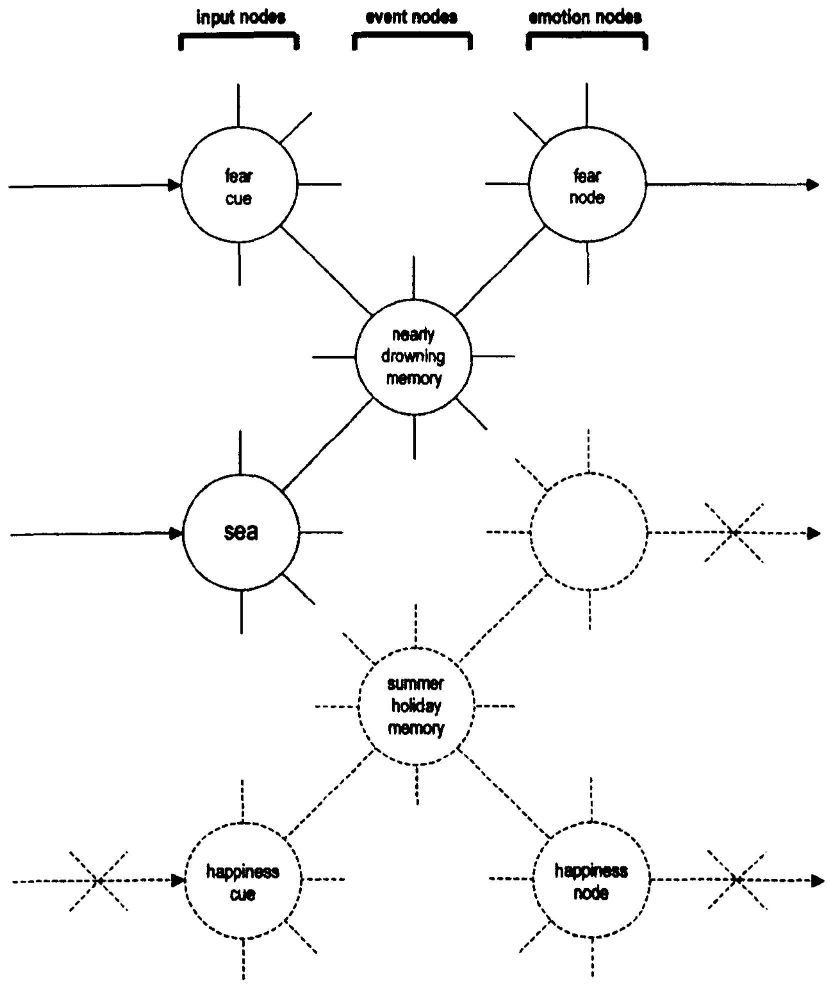
[12] A connectionist model for the 'slow emotional stroop effect' has been proposed by Bradley Wyble, Dinkar Sharma, and Howard Bowman (2005) at the Centre for Cognitive Neuroscience and Cognitive Systems, University of Kent. This model consists of three layers: an input layer, a category layer, and a response layer. The input layer contains input nodes for ink colour and word-form processing and is presumably located within what SPAARS describes as the analogical level of the mind. The category layer, on the other hand, 'is intended to represent activity in a semantic workspace' and is therefore located somewhere in the *propositional level*: for the sake of simplicity, this level has not been included in the main associative network model under discussion.

Frame 4.3: Diegetic (situational) cues: *Jaws* (1975)

How should we develop Spielberg's argument in associative network terms (see Figure 4.9)? To recap, Bower (1981) proposes that episodic memories are encoded as *event nodes* in an associative network: the memory would not be contained 'within' the event node itself; rather, the node would serve to connect the different details of the experience (spanning different levels of the mind). Allison Barnes and Paul Thagard (1997) propose that if the target person's situation sufficiently resembles an analogous situation in the observer's episodic memory, then retrieval can be spelt out in terms of parallel constraint satisfaction: that is, the network arrives at a memory which satisfies numerous constraints. In a related fashion, the distributed representations underlying our episodic memories are 'content addressable'; that is, being presented with a single aspect of a situation may be sufficient to reinstate a corresponding memory in its entirety.

In different circumstances, the situational cues 'sea' and 'swimming' would be capable of reinstating *positive* episodic memories, a possible example being the childhood memory of having spent an idyllic summer holiday at a seaside resort. All other things being equal, the corresponding event node would be strongly connected to the 'happiness node'. In the case of viewing the opening sequence, however, the situational cues 'sea' and 'swimming' would occur in conjunction with the various fear cues described both above and below. In light of this, the sequence would be more likely to 'reinstate' a *negative* episodic memory, a possible example being the childhood memory of having been (quite literally) 'thrown in at the deep end'. This time, the corresponding event node would be strongly connected to the fear node. Following Patrick Hogan (2003, pp.155-165), the memory in question would not have to be fully activated to play a role in eliciting a fear-type response; rather, it could be in a state of 'semi-activation', operating below the threshold of consciousness. Given, furthermore, that we have a tendency to attribute our emotional responses to the most salient objects in our environment, it is plausible that we would (mis)attribute our fear-type response to the sequence itself.

Figure 4.9: Diegetic (situational) cues: the role of event nodes



Based on Figure 1.3 from Bower (1992), p.25.

The opening sequence presents a number of other situational cues which may play an important role. Power and Dalgleish (1997, p.202) suggest that the situational cues of 'approaching' and 'fast-moving' may act as natural fear triggers. How does the sequence create such triggers? Significantly, this question brings us to a consideration of *film style*. The impression of 'approach' is partly created by means of *camera-work*. The sequence presents two underwater shots - apparently from the shark's point-of-view - which centre on the swimming girl (see Frame 4.3 again). The first underwater shot exploits the factor of *camera-placement*: the fact that the camera is placed in a non-anthropomorphic position

- i.e., below the earth-air interface described by Gibson - alerts us to the shark's presence and proximity. (Notice that at this point we know more than the girl, a point noted by both Carroll, 1990, and Grodal, 1997. Interestingly, the shot in question is followed by a long shot which confirms that the girl is in the middle of the sea with no coping resources. Both of these points will be addressed in the discussion of appraisal.) The second underwater shot introduces the factor of *camera-movement*: the camera closes in on the girl's body as her arms and legs paddle away in happy oblivion. Although the movement in this shot is created indirectly - i.e. camera moving to girl, as opposed to shark moving to camera - it exploits a visual phenomenon known as 'looming': this phenomenon occurs when an object increases in relative size, occupying a larger and larger proportion of our field of view. Crucially, Anderson (1996, p.85) explains the emotional impact of looming in nativist (and potentially associative) terms: he states that looming is 'universally perceived as threatening' and typically elicits responses of 'avoidance, retreat, and alarm'.

The impression of 'fast-movement', on the other hand, is partly created by means of *editing*. As soon as the shark attack begins, the editing rate (or transitional speed) increases by a potentially significant factor of around 1.6. (Similarly, in the shower scene from *Psycho*, Hitchcock employs an Eisensteinian 'montage of attractions': the filming of the murder allegedly involving seventy-odd camera setups (see Rebello, 1998).) Crucially, Messaris (1994, p.91) explains the emotional impact of a high editing rate and fast transitional speed in explicitly associative terms, suggesting that both 'can be seen as deriving their significance from a real-world association between speed and intensity'. Because we are incapable of attending to content and form simultaneously - and the emotional content is more salient - we are more likely to attribute this intensity to the situation itself - the shark attack or the murder - as opposed to the editing rate.

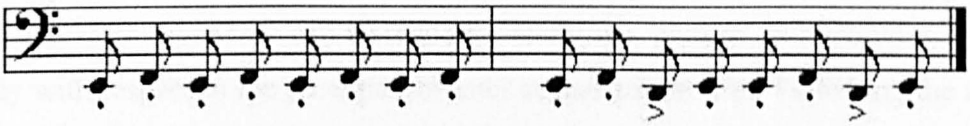
(ii) Non-diegetic cues

The proposed model suggests that the greater the number of (redundant) emotion cues presented, the greater the likelihood of generating an emotional response. The proposition that the film-maker works with something like this principle in mind is supported by the fact that they frequently add emotion cues from outside the world of the film. The most obvious examples of *non-diegetic cues* are provided by the film's music track.

A consideration of music brings us to a series of complex issues. In a discussion of music and film, Jeff Smith (1999) argues that many of the claims made about music in general - for example, that it lacks intentionality - do not apply to film music in particular, which accompanies a narrative featuring both characters and events. With respect to the relationship between music and emotion, Smith outlines two basic, and opposing, schools of thought. On the one hand, *cognitivists* such as Peter Kivy (1989) propose that music is merely capable of communicating the emotional state of a character or the emotional significance of a situation. On the other hand, *emotivists* such as Colin Radford (1989) propose that music is actually capable of eliciting an emotional state in the listener. Smith argues that the cognitivist and emotivist theories are not 'mutually exclusive', citing the fact that emotions comprise both cognitive and affective (physiological) components. With respect to cognition, he notes that music can influence the comprehension of affective meaning ('polarization'), and with respect to affect per se, he notes that music can have an 'additive effect' ('affective congruence'). Smith does not, however, attempt to incorporate these two components into an overall model of the emotion system, thereby showing how the cognitive relates to the affective. The integration of the cognitivist and emotivist theories of music can be strengthened by making reference to the SPAARS framework and a specific, and relatively simple, example of film music.

The affective power of music emphasised by emotivists can be partly explained in terms of the associative network route to (cinematic) emotion. The first underwater shot of the Watkins girl swimming cues the famous musical score written by John Williams (see Figure 4.10). When Williams first demonstrated the *shark theme* on a single piano - a simple 'two-note progression', beginning with E and moving to F - Spielberg thought he was joking. Nevertheless, the final (orchestrated) version of the score has been heralded as one of the most effective in movie history. In order to illustrate the importance of film music, for instance, Kalinak (1992, p.31) asks: 'Would the ocean seem menacing without the shark theme in *Jaws*?' In light of this undisputed success, is there something innately threatening about Williams's musical choice? Or to put it another way, does our interpretation of its threatening content rely on 'nature' as opposed to 'nuture'?

Figure 4.10: The shark theme (two-note progression)



Reprinted from Drannon (2000).

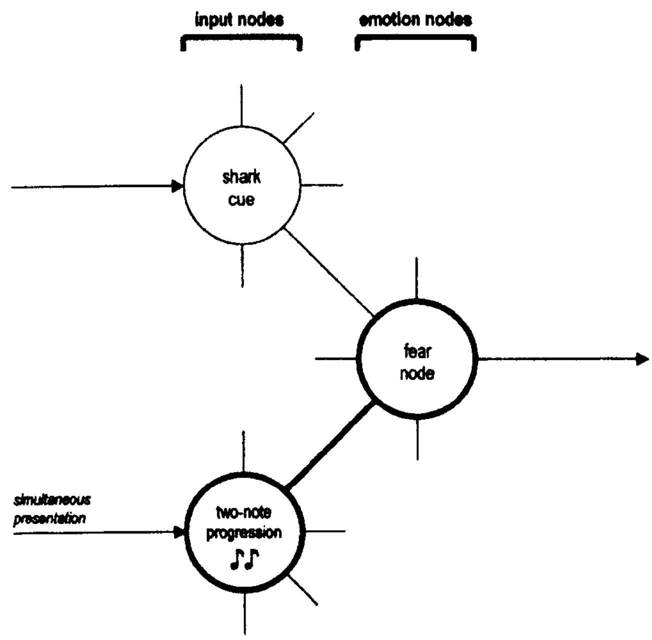
In a discussion of the byproduct explanation for the arts, Steven Pinker (1997, p.537) cites the shark theme as an example of 'pseudo-music': he suggests that 'the stripped-down figures and rhythms at the heart of a melody are simplified templates of evocative environmental sounds'. To what extent, can the emotional impact of the shark theme be understood in these terms? First, the final piece was scored for eight basses and five trombones - as partly indicated by the bass clef at the beginning of the notation (Kalinak, ibid., p.190). It is plausible that deeper sounds tend to be associated with larger, and more threatening, creatures, although, strangely, such associations are more likely to be based on human experience of certain land animals than human experience of oversized fish: for instance, Damasio (1994, p.131) cites growling as a possible example of a natural fear trigger. Even more strangely, perhaps, such associations may be based on human experience of potentially threatening but non-animistic phenomena, a possible example being the rumbling of thunder.

Second, music does not consist of individual sounds but collections of notes. The lack of resolution to the two-note progression creates an instant tension, whilst the increase in pitch, albeit by a semi-tone, may possibly signal approach. In addition, the two-note progression is manipulated in at least two simple ways: the alteration of dynamics (soft to loud) and tempo (slow to fast) may signal that whatever has been approaching from a distance has now entered the realm of one's personal (that is, immediate) space. Anderson (1996, p.85) suggests that the auditory equivalent of 'looming' may be as innately threatening as its visual counterpart, citing the sound effect of the approaching footsteps of a killer. In addition, a fast tempo may be naturally associated with a fast pulse, which, in turn, may be naturally associated with threatening situations: Damasio (ibid.) also cites 'certain configurations of body state'. To summarise, then, the shark theme - as an example of 'pseudo-music' - may comprise a number of natural fear triggers: each of these triggers may activate corresponding 'input nodes', which, in turn, send activation to the 'fear node' by means of associative connections which have been established, or 'biologically prepared', over the course of human evolution.

An even stronger case can be made for learning - 'nuture' as opposed to 'nature' - especially with respect to the reception of later scenes in the film. Following the research of Annabel Cohen (1993), Smith (ibid., p.165) proposes an associationist (connectionist) model for understanding our reception of film music. For our purposes, the key feature of this model is its relation to the associative network model described above: for instance, musical expressions (leitmotifs, signatures) become associatively connected with characters, situations, and ideas. As a result, musical expressions gain emotional significance, or, to use Bower's language, the 'input nodes' for musical expressions become connected with 'emotion nodes'. In the case of *Jaws*, it is plausible that the shark theme qua two-note progression becomes associatively connected with the shark, and, thereby, with the fear node: in other words, it becomes a learnt fear trigger (see Figure 4.11). Indeed, Williams talks explicitly about the viewer becoming 'conditioned', the two-note progression coming to elicit a fear response in the way that the sound of the bell ringing in Pavlov's famous experiment came to elicit a salivation response. Given, furthermore, that the two-note progression (qua input pattern) and fear response (qua output pattern) are 'presented' to the network simultaneously, the two may become associated by the process of Hebbian learning described previously.

Interestingly, Spielberg exploits the process of Hebbian learning to its full. As noted previously, the three false alarms - in the first half of the film - are *not* accompanied by the shark theme. Having conditioned the viewer to only expect the shark in the *presence* of the two-note progression, the first clear sighting of the shark - two thirds of the way into the film - occurs in the *absence* of any music whatsoever and, therefore, is all the more shocking. The insights of Williams and Spielberg also shed light on the 'additive effect' of music described by Smith: Spielberg, for instance, states that the musical score was responsible for 'half the success' of the film. When a preliminary version of the film was shown to test audiences without the musical score, it gained a disappointing reception. Conversely, the soundtrack album - musical score without film - has been described as a poor listening experience, one commentator asking, 'Who wants to sit and listen to the shark theme on a snowy day in Montana?' These two anecdotes suggest that the realisation of the film's affective potential requires the additional activation of the fear node provided by the music, whilst the realisation of the music's affective potential requires the additional activation of the fear node provided by the film.

Figure 4.11: Non-diegetic (musical) cues: the role of Hebbian learning



N.B. According to the Hebb rule, if a musical input node *m* and an emotion node *e* are activated simultaneously, then the weight of the associative connection between *m* and *e* is strengthened.

It should be acknowledged that Williams's musical score develops in terms of complexity (see Figure 4.12a). As soon as the shark starts to attack the Watkins girl, the shark theme segues into what Andrew Drannon (2000) describes as 'Hermannesque horror scoring'. (Presumably, Drannon is thinking here of the famous 'screeching violins' which accompany the shower scene cited previously - see Figure 4.12b.) At this point, brass and strings 'dissonances' express the emotional state of the girl (the seventh motif), whilst variations of the shark theme continue to signal the presence of the shark. (When the music calms during the inserts of the man lying on the beach, we hear instances of 'shimmering harp'.) Despite the increase in complexity, however, we can still offer tentative 'mimetic-type' explanations for the affective impact of the music: for instance, the Hermannesque strings approximate the sound of human screams - and affectively complement the sound of the girl's screams on the diegetic soundtrack - whilst the 'dissonances' create tension in a similar way to the unresolved two-note progression playing beneath. It should be noted that the music reaches a climax and terminates as the girl is pulled under the water (see Frame 4.2a). Considering that this music occurs in conjunction with the facial, bodily, and vocal expressions of fear - and the dialogue "Oh my God!" and "God help me!" - described above, the shot in question presents the densest 'configuration' of emotion cues in the entire sequence, plausibly resulting in the strongest activation of the fear node.

Figure 4.12a: The seventh motif (*Jaws*, 1975)

Figure 4.12b: 'The shower' (*Psycho*, 1960)

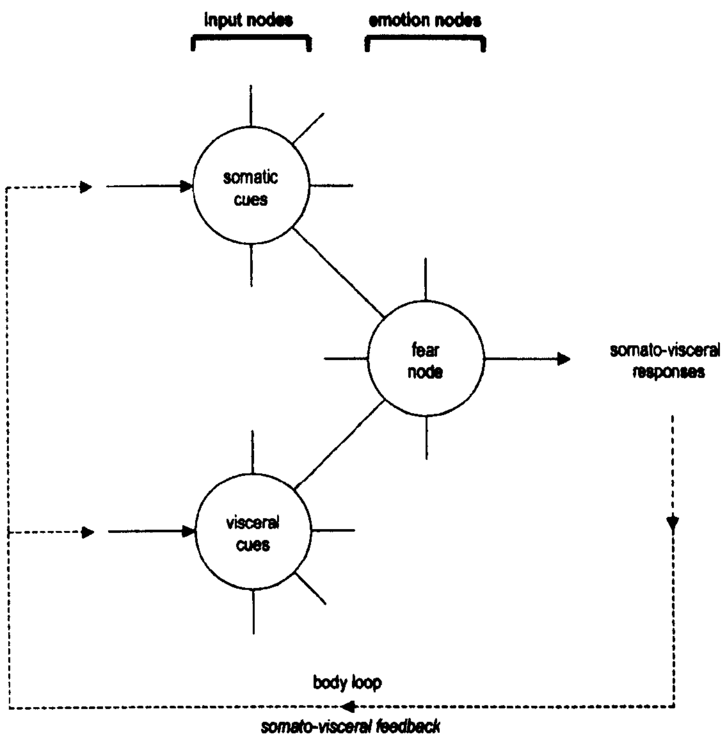
Figures 4.12a and b are reprinted from Drannon (2000) and Tagg (1992) respectively.

(iii) Somato-visceral cues

The third and final category of emotion cues originates in the 'theatre' of the viewer's body and brain: namely, *somato-visceral cues*. Given the reputation of both *Jaws* and *Psycho* as significant examples of the horror genre, it is plausible that the horrific content of the scenes described above will generate fear-type responses in a significant number of viewers. (Note that these responses might also be generated via the cognitive appraisal route to (cinematic) emotion - to be discussed below.) To recap, our fear responses would comprise two components. The physiological component would involve the internal organs (*viscera*): for instance, upon seeing the Watkins girl attacked by the shark we might experience changes in heart rate, respiration, and perspiration, along with an adrenaline-rush. The behavioural component, on the other hand, would involve the skeletal muscles (*soma*): although we would refrain from both running out of the cinema and offering the character of Marion Crane any assistance, our muscles might tense up in 'preparation' for fight-or-flight action. According to Damasio's account of somato-visceral feedback (described in section 3.2), interoceptive information (regarding visceral body states) and proprioceptive information (regarding somatic body states) would be signalled via the 'body loop' to somatosensory structures in the central nervous system, from the brain stem upwards.

The associative network model allows us to clarify and elaborate on the role of somato-visceral feedback (see Figure 4.13). To begin with, we should think of the somato-visceral cues in question as emotion cues in their own right, and the somatosensory structures described by Damasio as input nodes in a 'massively distributed' associative network. In particular, the associative (network) account improves our understanding in two respects. First, the account allows us to demonstrate how our emotional responses to fiction film may be self-perpetuating: as the diagram illustrates, somato-visceral cues might activate the fear node by means of associative connections, thereby generating further fearful states. (This claim is supported by neurobiological evidence: LeDoux, 1993, p.115, claims that 'the amygdala also receives messages back concerning the visceral responses it produces'.) Second, the account allows us to support LeDoux's (1998, p.294) proposal that somato-visceral feedback has sufficient 'specificity' to distinguish, say, the adrenaline-fuelled fear we might experience upon (observing a character) being attacked, from the adrenaline-fuelled excitement we might experience upon (observing an athlete) winning a marathon, as long as we consider the 'biological context' in which such feedback occurs. As we have seen in the discussion of diegetic (personal) cues, an associative (connectionist) network may be capable of taking biological context into account (see Figure 4.7). In order to adapt this model to suit our current purposes, simply replace the input node for 'facial expression X' with one for 'somato-visceral feedback X', and the 'happiness node' with an 'excitement node'.

Figure 4.13: Somato-visceral cues: the role of somato-visceral feedback

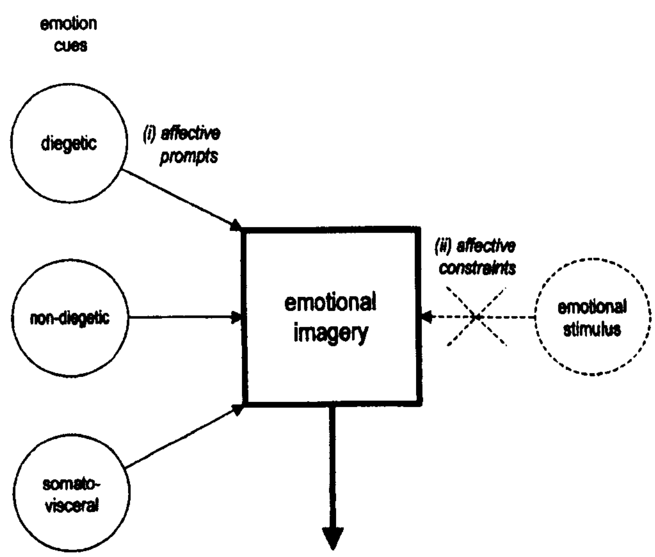


* * *

In conclusion, the account of the associative network route to (cinematic) emotion enables us to understand the impact of the (multiple) emotion cues presented by both the world and the cinema. The sequences from *Jaws* and *Psycho* present us with an array of fear cues: diegetic cues are presented from inside the filmic world (the main sources being the person and the situation); non-diegetic cues are presented from outside the filmic world (the main source being the music track); and somato-visceral cues are presented via the 'theatre' of the brain and body. Individually and collectively, these fear cues would be capable of activating the fear node and eliciting a fear-type response. According to attribution theory (introduced in section 3.3), we would causally attribute these responses to the respective sequences as the most salient aspects of our environment.

The final issue we need to address concerns the question of why it seems to be more effective to 'leave something to the imagination'. The exact nature of the imagination - otherwise known as emotional imagery - will be discussed in Chapter 5. For the time being, we should note a simple dynamic (see Figure 4.14). On the one hand, it is plausible that each of the fear cues described operates as an *affective prompt*: Spielberg states that he wanted the girl's 'violent jerking motions' to 'trigger our imagination' about what is happening below the surface of the water. On the other hand, by denying us the view of the emotional stimulus - either the threatening creature or the unknown assailant - the film does not provide us with sufficient information to *affectively constrain* this imaginative process once it has been brought into play. There is nothing to tie our imagination down, nothing to stop it spiralling, as it were - hence, our tendency to 'imagine the worse'.

Figure 4.14: Emotional imagery: affective prompts versus affective constraints



4.3 TRACING THE COGNITIVE APPRAISAL ROUTE TO (CINEMATIC) EMOTION

(a) Another approach to (cinematic) emotion: the role of situational meaning

How should we go about tracing the cognitive appraisal route to (cinematic) emotion? In Chapter 3 (section 3.2), we introduced the role of cognitive appraisal but did not describe it in any detail. In particular, we did not answer the question of whether or not cognitive appraisal relies on existence beliefs. It is time now to address these outstanding issues.

Let us begin by reiterating two emotional extremes. The first extreme is represented by the *primary emotions* - otherwise known as 'affect programs' (Griffiths, 1997) - and centres on the notion of an 'emotional stimulus' (qua sensory object). Once again, the most obvious example is the prototypical fear scenario of being confronted by a threatening creature. In this case, a neurobiological account seems to be sufficient: if the emotional impact of the creature can be explained in terms of the associative matching of a perceptual pattern with some sort of 'template' in the emotion system, then we need not refer to cognitive appraisal - and the entities of goals and concerns - at all. The second extreme is represented by the *secondary emotions* - otherwise known as 'higher cognitive emotions' (ibid.) - and centres on the notion of 'situational meaning' (as a type of abstract object). Possible examples are the 'existential' or 'abstract fears' described in section 4.1. In this case, a cognitive account is required: if the emotional impact of situational meaning cannot be explained in terms of the associative matching process described above, then we are obliged to propose that cognitive appraisal - in reference to goals and concerns - plays some sort of causal role in the proceedings.

For the pragmatic purpose of bridging the gap between the neurobiological and cognitive accounts - whilst dealing with a short, and relatively self-contained, film sequence - it will be best to find a kind of halfway point between the two extremes: that is, primary emotions (or 'affect programs') which are elaborated by 'higher cognitive processing'. Perhaps the best example is being in the *apparent* presence and proximity of a threatening creature which is 'sensory' and 'stimulus-based' on the one hand, but out of sight - and therefore 'abstract' and 'meaning-based' - on the other. As we have seen, LeDoux (1998, p.177) states that cognitive appraisal is probably mediated by the prefrontal cortex. Given the limitations of brain imagining techniques and so forth, however, we need to go beyond the neurobiological level of explanation. For a philosopher such as Robert Roberts (2003, Ch. 1) - who is critical of the neurobiological account - the answer lies in conceptual analysis; an approach which investigates 'the ways people talk about the emotions in the contexts of their life'. From my perspective as a cognitive theorist, it lies in appealing to a *cognitive* (and an *intentional*) level of explanation; an approach which will allow us to make a distinction between different types of appraisal.

(i) A story about a shark within a story about a beach

In order to trace the cognitive appraisal route to (cinematic) emotion, we need to compare the appraisal processes which are inspired by cinematic situations with those which are inspired by their real-world counterparts. In the opening sequence from *Jaws*, the underwater POV shots and ominous musical score serve as indirect indications of the presence and proximity of the shark; considering that a real-world situation is unlikely to present such emotion cues, we need to find a film sequence which begins by placing us in the same position as the 'target character', whilst relying on a more natural form of communication, the most obvious example being human speech. In addition, it will suit our purposes to demonstrate - at least implicitly - how appraisals (and associations) operate not only between a cinematic situation and a real-world counterpart, but also between one film and another.

These various considerations bring us to our chosen example. A short, and relatively self-contained, sequence from Danny Boyle's *The Beach* (2000) pays homage to the cultural legacy of Spielberg's earlier film. Richard (played by Leonardo DiCaprio) is travelling in Thailand with a young French couple, Etienne (Guillaume Canet) and Françoise (Virginie Ledoyen). In an attempt to reach an island which houses the legendary beach of the film's title, the three travellers are forced to swim the final stretch of their journey (see Frame 4.4). Halfway across, Etienne fearfully informs Richard that he has seen a shark fin about one hundred metres away. A few moments later, we hear Etienne cry out off-screen as Françoise is "pulled under" the water. In a state of panic, Richard remonstrates with Etienne about what might have happened to Françoise. The scene ends with a series of underwater POV shots which close in on Richard. The final POV shot is only inches away from his body. Richard cries out but, contrary to our expectations, Françoise - rather than a shark - breaks through the surface of the water. Etienne and Françoise burst out laughing. It transpires that both Richard and we, the viewer, have been the dupes of an elaborate joke.

Frame 4.4: A story about a shark within a story about a beach: *The Beach* (2000)

Etienne's story about a shark bears an obvious resemblance to Radford's example of the man's 'harrowing story' about his sister: i.e., we are told a 'harrowing story' which turns out to be false. Notice, however, that this is an instance of a story *within* a story. In order to appreciate the potential strangeness of this fact, it will be informative to turn briefly to the original novel by Alex Garland (1997). In the fourth part of the novel, Garland describes the three characters' swim to the island by using the character of Richard as a first-person narrator:

> The swim passed in stages. The first was full of confidence, chatting as we found a kicking rhythm, and making jokes about sharks. Then, as our legs began to ache and the water no longer felt cold enough to cool us down, we stopped talking. By this time, as on the boat ride from Ko Samui, the beach behind us seemed as far away as the island ahead. The jokes about sharks became fears, and I started to doubt that I had the strength to finish the swim. Or doubt, quote unquote. We were about halfway between the two points. Not being able to finish the swim would mean dying. (p.71)

Although Garland places us in the position of Richard - in terms of narrational knowledge - and refers to the characters 'making jokes about sharks', he does not attempt to fool us in the manner described: for instance, he does not write a dialogue exchange in which Etienne informs Richard that he has seen a shark fin about one hundred metres away. Whether or not Garland entertained this option (and then rejected it), it is intriguing to speculate whether or not Etienne's story would have been capable of eliciting a fear response of equivalent intensity in the context of the novel. If we are inclined to argue for the negative, then we are left with the following question: What is it about the medium of film in particular that makes it plausible that we appraise Etienne's story as if it were of direct relevance to our own personal well-being as viewers?

(ii) The role of cognition in SPAARS

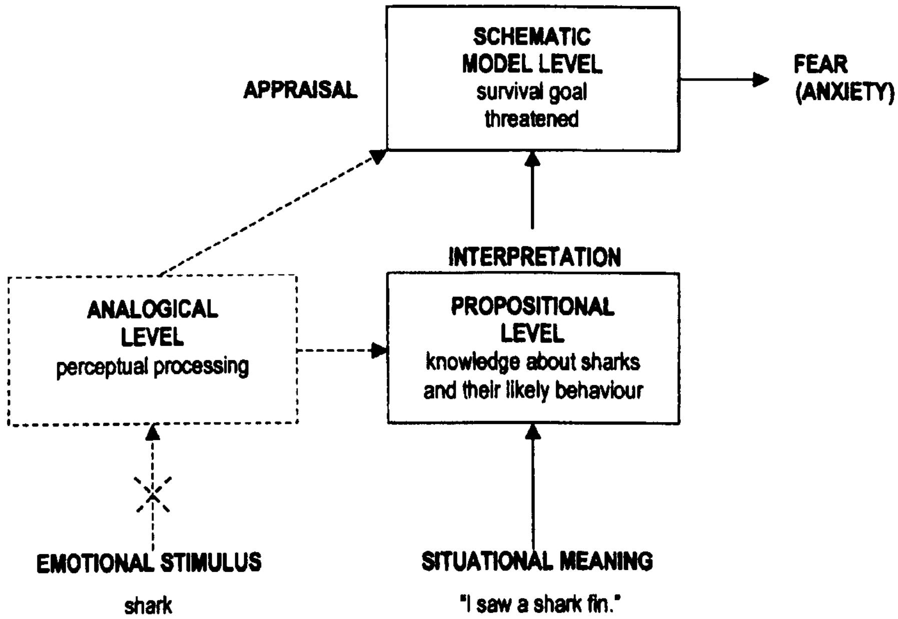
How should we understand the role of cognition in SPAARS? Imagine being in an equivalent situation in the real world, swimming in shark-infested waters with two friends, one of whom fearfully informs you that they have seen a shark fin about one hundred metres away. Following the SPAARS framework advanced by Power and Dalgleish, our emotional response to this situation can be broken down into two key stages (see Figure 4.15).[13]

(1) The propositional level of the mind. The first stage of the process would involve the propositional level of the mind where, to paraphrase Power and Dalgleish, knowledge about sharks and their likely behaviour would be activated. This process would result in an *interpretation* of the situational meaning: for instance, "It is possible that the shark is going to attack us." Significantly, however, this interpretation would be 'cold' and 'non-emotional' in nature; that is, it would not be capable of generating an emotional response in its own right.

(2) The schematic model level of the mind. The second stage of the process involves the schematic model level of the mind. According to Oatley and Johnson-Laird's (1987) cognitive theory of emotions, each of the five 'basic' emotions occurs when there is a 'juncture' (i.e., a critical moment) in either a goal or a plan: for instance, fear occurs when a survival goal is 'threatened', disgust when a gustatory goal is 'violated', anger when an active goal is 'frustrated', sadness when a significant goal is 'lost', and happiness when a significant goal is 'achieved'. In light of this, the 'cold' and 'non-emotional' interpretation would be related to our survival 'goal structures' to produce a 'hot' and 'emotional' *appraisal* of the situation: we can think of this appraisal as effectively adding an exclamation mark to the above statement. The end-result would be the generation of an adaptive emotional response (namely, fear) with its associated physiological, behavioural, and subjective components.

[13] Power and Dalgleish cite a version of the prototypical fear situation originally described by William James in 1884: Susan encounters a threatening bear in the woods (pp.169-173). According to the authors, the process begins with the *analogical level* of the mind: 'the bear would be perceived and recognised via visual analogical representations.' In order to separate the cognitive account from the neurobiological one, however, we need to remove the 'analogical' from the emotional equation. Although in a strict sense our friend's words would be processed by analogical systems - namely, auditory and language-processing systems - this processing would not be of direct emotional significance.

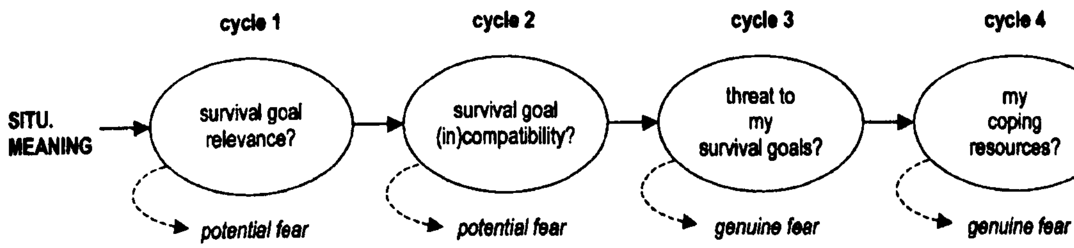
Figure 4.15: The schematic model level route to emotion



Adapted from Figure 5.5 from Power and Dalgleish (1997), p.172.

Power and Dalgleish (pp.204-205) go on to describe the 'cycles of appraisal' in operation when we are confronted by a potentially threatening situation in the real world (see Figure 4.16). The first cycle of appraisal effectively says "I am confronted by an emotional event (i.e., an event which is of relevance to goals and concerns).", whilst the second cycle effectively says "This event is potentially incompatible with those goals and concerns." In the third and fourth cycles, the true nature of the threat - and its relation to our goals - is appraised, with reference to available 'coping resources'. Significantly, Power and Dalgleish propose that fear can be a 'function' of the first two cycles of appraisal alone, citing the following example: 'When we sit strapped in to the roller coaster before it starts, we cannot help feeling a tingle of fear, even though we have chosen to be there. The appraisal that the threat is "wanted" makes no difference.'

Figure 4.16: Cycles of appraisal (appraisal cycle format)



Based on Figure 6.3 from Power and Dalgleish (1997), p.205.

(b) Understanding the cognitive level of the mind [14]

How should we develop our understanding of the cognitive level of the mind? The relevance of Power and Dalgleish's rollercoaster example to film viewing is obvious: simply replace the seat in the rollercoaster with a seat in a cinema. In order, however, to develop our understanding of the appraisal process - and to clarify the specific role played by the different appraisal cycles - let us consider two examples of appraisal theory.

(i) Lazarus's appraisal theory

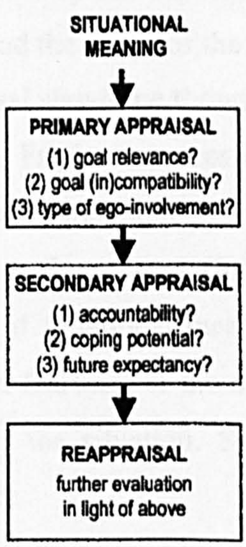
The first example of appraisal theory is provided by Richard Lazarus (1991).[15] Lazarus proposes that each type of emotion corresponds to a particular 'person-environment relationship' and each type of *relational meaning* corresponds to a *core relational theme*. In the case of fear, for instance, the core relational theme is 'the concrete and sudden danger of *imminent physical harm*' (p.234). If a person values the goal of self-preservation (an example of a personal variable) on the one hand, but their environment contains a man-eating shark (an environmental variable) on the other, then the most appropriate emotion is fear. If either of these conditions fails to hold, however, then fear will not ensue. (An alternative scenario is as follows: the person may value the goal of self-preservation but not believe that the shark poses a genuine threat.)

[14] For a recent discussion of appraisal theories of emotion, see Scherer (1999).

[15] Also see Lazarus (1966); Smith and Lazarus (1993).

The assessment of the relational meaning in operation requires cognitive appraisal. In this respect, Lazarus makes a significant distinction between three types of appraisal (see Figure 4.17).[16] *Primary appraisal* typically involves the assessment of the components of goal relevance, goal (in)congruence, and type of ego-involvement. At this stage, a key question would be: "Is apparent proximity to a shark potentially incongruent with my (survival) goals?" The answer to this question - "Yes: some sharks are man-eaters!" - would suggest that a negative emotion is appropriate. *Secondary appraisal*, on the other hand, typically involves the assessment of the components of accountability, coping potential, and future expectancy. At this stage, a key question would be: 'What are my coping resources?' The answer to this question - "None: I am in the middle of the sea with no means of protection!" - would determine the exact nature of the negative emotion (namely, fear). Third and final, *reappraisal* would entail a further evaluation of the situation in light of emotional feedback from primary and secondary appraisal. It should be stressed that we should not think of these stages as occurring in sequence; rather, they may occur simultaneously (or even in reverse): Lazarus states that 'a decision-tree format helps the reader to understand the theoretical or explanatory logic of appraisal but does not describe how a person goes about appraising in the real world' (p.151).

Figure 4.17: Stages ofappraisal (decision tree format)



[16] In the case of fear, Lazarus proposes that ego-involvement is not essential; no secondary appraisal components are essential, as accountability (blame) is 'irrelevant' and both coping resources and future expectancies are 'uncertain' (pp.236-238).

(ii) Frijda's appraisal theory

The second example of appraisal theory is advanced by Nico Fridja (1986), whose work forms a significant part of Ed Tan's (1996) account of filmic emotion. Frijda proposes that each emotion corresponds to a particular *situational meaning structure.* Because this structure incorporates both personal and environmental variables in the way described above, it should not be thought of as a 'stimulus pattern' (p.195). Similarly, the assessment of situational meaning requires cognitive appraisal. Considering these two points, then, Frijda's notion of 'situational meaning' corresponds to Lazarus's notion of 'relational meaning'. Following Lazarus's earlier work, moreover, Frijda also makes a distinction between primary and secondary appraisal (pp.204-214). According to Frijda, primary appraisal involves the assessment of the 'core components' of situational meaning, whereas secondary appraisal involves the assessment of the 'context components'. Once again, the end-results of secondary appraisal may determine the status of the experienced emotion. (Frijda, 1988, cites various laws of emotion: for example, the 'Law of Situational Meaning', the 'Law of Concern', and the 'Law of Apparent Reality'.)

Significantly, Frijda (1993) questions the complexity and conscious nature of the appraisal process, claiming that appraisal theorists tend to confuse the 'cognitive elaboration' of emotional experience (accessible by self-report) for the 'cognitive antecedents' of emotion (not accessible by self-report). In contrast, Frijda suggests that the assessment of situational meaning and the status of the experienced emotion is achieved by primary appraisal alone; this appraisal should be thought of as an automatic, nonconscious process (ibid., p.374). Interestingly, Frijda compares the primary appraisal of an event's emotional significance to the 'direct perception' of what that event *affords* - or, more precisely perhaps, does *not* afford - the subject (ibid., p.381). To return to our shark example, then, the initial appraisal of situational meaning would occur automatically and non-consciously; we would respond fearfully to the apparent danger without consciously weighing up the pros and cons of the situation. Subsequent appraisals would merely elaborate upon our fearful experience.

(c) Illustrating the model

Having considered two examples of appraisal theory, we are in a position to propose a model of the cognitive appraisal route to (cinematic) emotion (see Figures 4.18a and b). This model combines the different appraisal cycles described by Power and Dalgleish with a revised interpretation of the different appraisal stages described by Lazarus and Frijda - and is illustrated in two formats accordingly.

Although Lazarus (1991, pp.292-296) briefly discusses the 'aesthetic emotions', he acknowledges that psychologists have given little attention to this subject, citing Frijda (1989) as the only example of significance. Frijda, however, appeals to the problematic notion of 'suspending disbelief'. Ironically, the proposed model suggests that a key to understanding such emotions lies in revising their own two- (and three-) fold distinctions between the different stages of appraisal - a revision which, moreover, allows us to reconcile the earlier and later versions of Frijda's theory. This revision also allows us to account for the emotional impact of the second, third, and fourth ways of 'seeing' described in Chapter 2.

Figure 4.18a: The cognitive appraisal route: appraisal cycle format

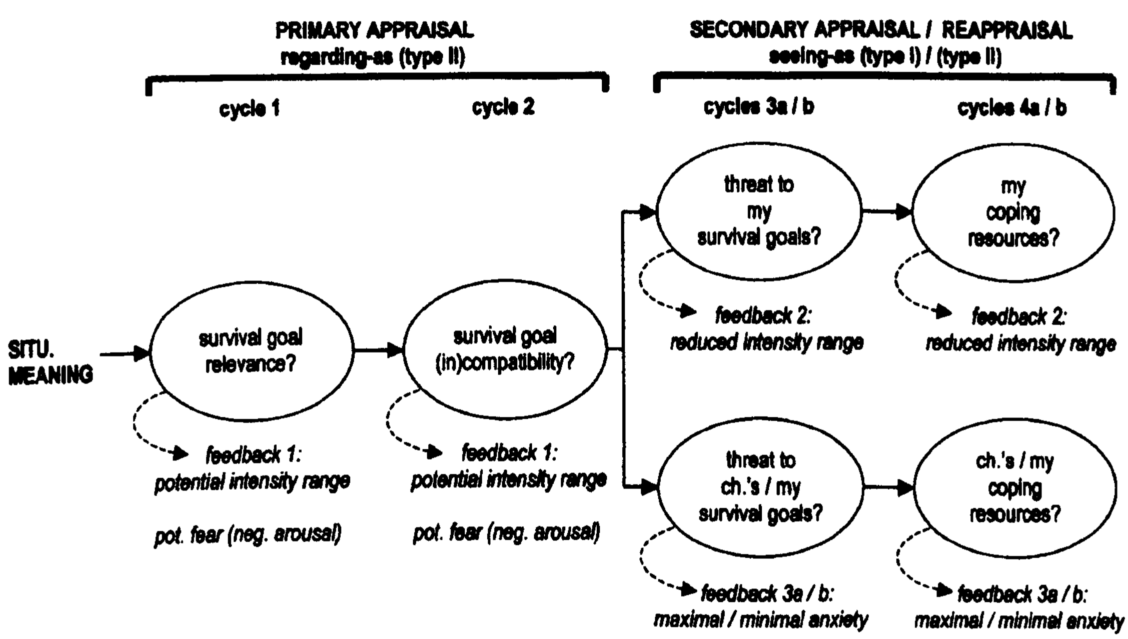
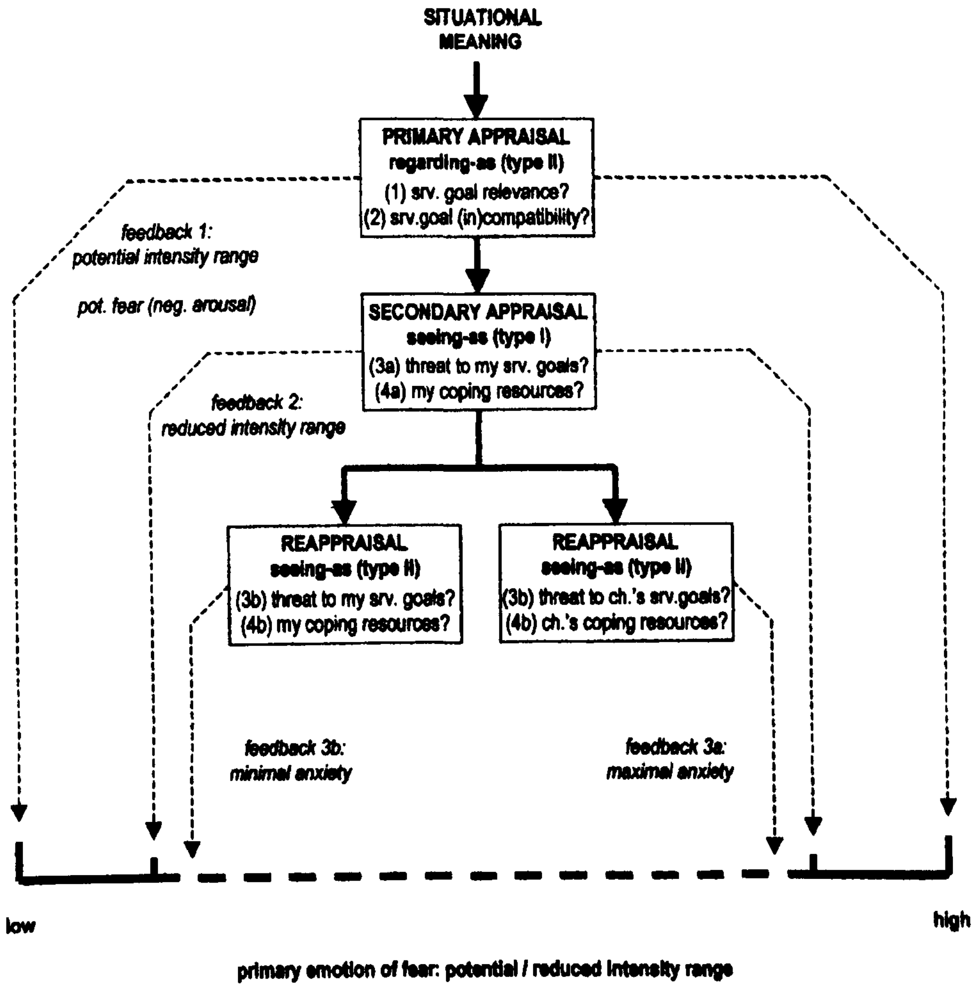


Figure 4.18b: The cognitive appraisal route: decision tree format



(i) Primary appraisal (automatic appraisal)

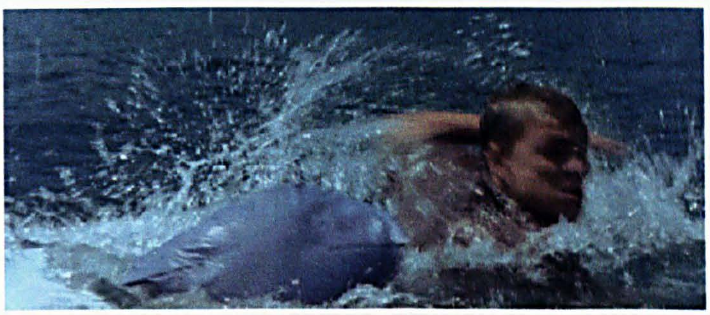
According to the proposed model, the primary appraisal stage assesses the meaning of the depicted situation *with respect to the characters as protagonists.*[17] This move allows us to accept Frijda's (1993) proposal that primary appraisal alone is capable of determining the specific nature of the most appropriate emotion, whilst adding the qualification that the emotion in question relates to the characters as protagonists (as opposed to ourselves as viewers).

A consideration of the primary appraisal stage allows us to understand the emotional impact of the second way of 'seeing' described in Chapter 2. Following our

[17] Although the situational meaning for the character and the viewer may differ - according to the distribution of narrational information - in this particular case it coincides (see Tan, 1996, p.184; Hogan, 2003, p.150).

discussion of Darwinian modularity, we should think of primary appraisal as being performed by what Ekman (2003, p.21) describes as an 'automatic-appraising mechanism', or *autoappraiser* for short. With respect to film viewing, automatic appraisal provides us with another example of *regarding-as (type II)* in the sense that it is relatively 'sensitive' to the personal and environmental variables cited by Lazarus on the one hand, but relatively 'insensitive' to those variables - existence beliefs, knowledge, and memories - which pertain to the true nature of our environment on the other. Subsequent feedback effectively determines the potential 'intensity range' of our emotional responses, generating a negative emotional state which has the potential to become full-blown fear.

Frame 4.5: Influences on primary appraisal: close shot from *The Beach* (1999)



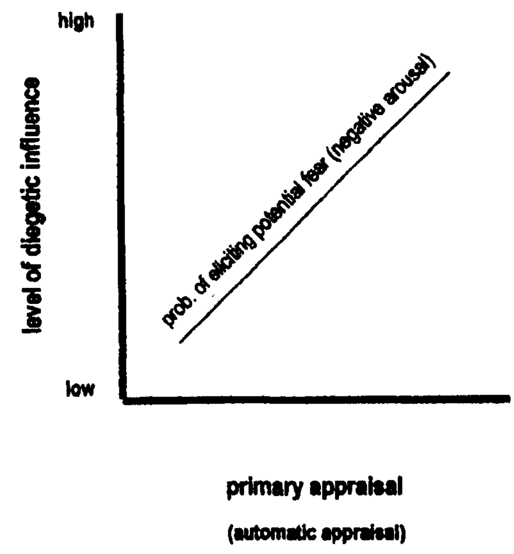
□ *Adoption of goals: the role of the diegetic effect*

In order to understand the dynamics of the primary appraisal stage, let us consider two key questions. The first key question is: why do we assess the meaning of the depicted situation with respect to the characters - effectively adopting the characters' goals - when we 'know' that they are only fictional? On the one hand, Alex Garland as a novelist is able to describe the swimming stage of the three characters' journey. In a discussion which focuses on literary fictions, Keith Oatley (1994) implies that the reader 'adopts' the goals of the character through an act of will. On the other hand, Danny Boyle as a film-maker is able to realise the journey's true 'affective potential'. In a discussion of filmic fictions, Grodal (1997) proposes that the viewer 'adopts' the goals of the character through the process of 'cognitive identification'. The proposed model suggests an alternative explanation. Because our survival 'goal structures' are, by definition, fundamentally related to survival, it stands to reason that they are always 'on standby' and always 'on a hair-trigger', readily brought into play by *apparently* dangerous situations.

This point brings us back to the *diegetic effect* in terms of presence and immersion (see section 2.2). Considering that our perceptual access to the sea environment in question is partially determined by the nature of the viewing situation, let us assume that we view the sequence in a modern multiplex theatre. In this particular situation, the size of the filmic image (as measured by visual angle) and the shape of the filmic image (2.35:1 widescreen aspect ratio) would produce a high level of what Loomis would describe as 'equivalent visual information'. Conversely, the lack of illumination in the theatre would incidentally play a significant role in minimising the salience of the theatrical environment in which we are actually situated, thereby producing a low level of 'non-equivalent visual information'. In addition to the viewing situation, our perceptual access to the sea environment is obviously manipulated by Boyle himself. With the notable exception of a single long shot discussed below, all of the shots are filmed close to both the characters and the water's surface (see Frame 4.5, above): filming close to the characters increases the salience of certain personal cues (for example, facial and bodily expressions of fear and alarm), whilst filming close to the undulating surface of the water maximises motion parallax and visual kinesthesis (in other words, we may feel as if we are actually floating along with the characters).

In conclusion, we can propose a first functional relationship (see Figure 4.19): the higher the level of diegetic influence - and the higher the level of 'apparent reality' - the higher the probability of a successful primary appraisal taking place; that is, a primary appraisal which is capable of eliciting potential fear (negative arousal).

Figure 4.19: Functional relationship I: the role of the diegetic effect



□ *Appraisal cycles 1 and 2: goal relevance and goal incompatibility*

The second key question is: how does the process of primary appraisal operate? In the proposed model, the process goes through at least two basic cycles. The first cycle determines that the depicted situation is of potential relevance to our goals in general by effectively saying, "I am in an emotional situation," whilst the second cycle determines that the situation is incompatible with our survival goals in particular by saying something along the lines of, "I am in danger."

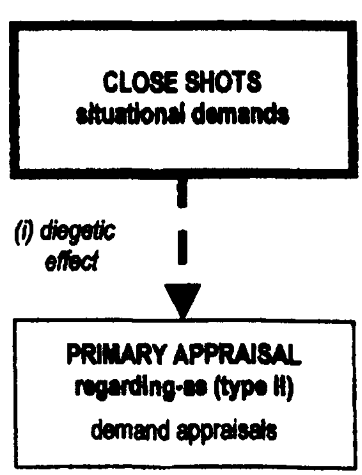
How is goal relevance and goal incompatibility communicated? The first channel of communication originates within the world of the film. In the sequence in question, the main source of diegetic communication is provided by the dialogue. The appraisal of the statement, "I saw a (shark) fin," would be similar - if not identical - to the appraisal of its real-world counterpart: for instance, it would involve the automatic processing of information at the propositional and schematic model levels of the mind in the manner described above, the 'cold' interpretation, "fin equals shark," being followed by the 'hot' appraisal, "shark equals danger!"[18]

[18] In the opening sequence from *Jaws*, the presence of the shark is partly communicated by the two underwater POV shots, whilst the size and threat of the shark is partly communicated by the Watkins girl's 'thrashing' body movements.

Another source of diegetic communication is provided by the 'affective cues' presented by the given situation (see Figure 4.20). According to Blascovich and Mendes's (2000) 'biopsychosocial model', we assess an 'active performance situation' - for instance, taking an exam - for either challenge or threat: following Lazarus's distinction between primary and secondary appraisal, we perform various 'demand' and 'resource appraisals' respectively.[19] If the situational resources outweigh the situational demands (for example, we are well-prepared for the exam), then we experience a sense of challenge; if, on the other hand, the situational demands outweigh the situational resources (the exam questions turn out to be more difficult than we had expected), then we experience a sense of threat.

Although Blascovich and Mendes cite 'viewing a scary film' as an example of a 'passive performance situation' - in other words, a case which falls outside the rubric of their particular model - at the level of primary appraisal, the depicted situation would be treated in a decidedly active fashion (p.60). Given that this is the case, we can consider the authors's proposal that demand appraisals involve an assessment of at least three different factors: the depicted situation entails 'danger' (a possible shark), 'uncertainty' (regarding the exact nature and whereabouts of the shark), and 'required effort' (regarding the possibilities of escape). Significantly, each of these demand appraisals might be influenced by affective cues: for instance, the close shots of the sea might be associated with danger (drowning), uncertainty (depth of water), and required effort (swimming to safety). (The relationship between affective cues and resource appraisals will be discussed in the section on reappraisal, below.)

Figure 4.20: Primary appraisal: the role of demand appraisals (and the diegetic effect)

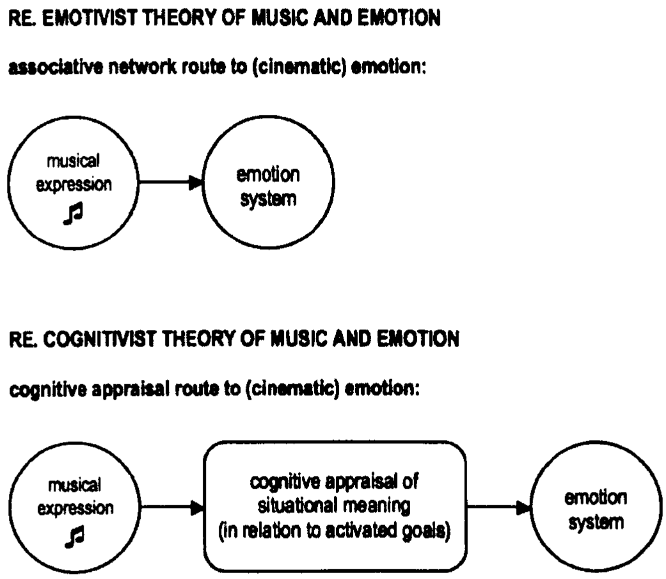


[19] Thanks to Jim Blascovich, Department of Psychology, UCSB, for introducing me to this model.

The second channel of communication originates outside the world of the film: the most obvious source of non-diegetic communication is the music track (see Figure 4.21). As we have seen, the associationist (connectionist) account allows us to support the emotivist proposal that music is actually capable of eliciting an emotional state in the listener. How, though, should we understand the *cognitivist* proposal that music is merely capable of communicating the emotional state of a character or the emotional significance of a situation? And how should we reconcile the cognitivist and emotivist positions? The musical score written by Angelo Badalamenti is another example of what Pinker describes as 'pseudo-music' (resembling Williams's score for *Jaws* in significant respects). Regarding the cognitive process of communication, it is plausible that Badalamenti's score would be interpreted as signalling the presence of the shark, whilst the alteration of dynamics (soft to loud) and tempo (slow to fast) would be interpreted as signalling the shark's approach. These interpretations would be performed at the propositional level of the mind and be essentially cognitive - that is, 'cold' and 'non-emotional' - in nature.

The cognitivist's mistake is to assume that the story ends here. As stated previously, Smith argues that many of the claims made about music in general - for example, that it lacks intentionality - do not apply to film music in particular which accompanies an audiovisual narrative featuring both characters and events. In a related fashion, the assumption that music lacks emotionality need not apply to film music which accompanies an audiovisual narrative which somehow encourages us to 'take on' the goals of the characters as they encounter the events in question. This acknowledgement brings us to the crucial link. At the schematic model level of the mind, the 'cold' and 'non-emotional' interpretation of the music track would be related to the goal structures in question to produce a 'hot' and 'emotional' *appraisal* of the situation, thereby generating some sort of fear response. In conclusion, the appraisal account provides us with a potential way of resolving the cognitivist-emotivist debate - at least with respect to film music - by allowing us to causally relate the communicative function emphasised by cognitivists with the affective function emphasised by emotivists.

Figure 4.21: Reconciling the emotivist and cognitivist theories of music and emotion



(ii) Secondary appraisal

According to the proposed model, the secondary appraisal stage assesses the meaning of the depicted situation *with respect to ourselves as viewers*. This move allows us to accept both Lazarus's (1991) and Frijda's (1986) proposal that secondary appraisal is required to determine the specific nature of the most appropriate emotion, whilst adding the qualification that the emotion in question relates to ourselves as viewers (as opposed to the characters as protagonists).

A consideration of the secondary appraisal stage allows us to (further) understand the emotional impact of the third way of 'seeing' described in Chapter 2. Following our discussion of central processing, we should think of secondary appraisal as being equivalent to the *central process* which is 'sensitive' to those variables - non-existence beliefs, knowledge, and memories - pertaining to the true nature of our situation. With respect to film viewing, the central process in question provides us with another example of *seeing-as (type I)* in the sense that it successfully distinguishes a cinematic representation from its actual referent, thereby stipulating that the depicted situation is not of emotional significance with respect to our own goals and concerns. The subsequent feedback would effectively *reduce* the potential intensity range of our negative responses, thereby determining that our emotional state could not develop into full-blown fear.

□ *Adoption of goals: the viewing situation*

In the case of secondary appraisal, the first key question is: why do we assess the meaning of the depicted situation from the perspective of - and adopt the goals of - a person placed in a non-threatening viewing situation? In this instance, the answer is simple: we really *are* in a non-threatening viewing situation. It is reasonable to assume, therefore, that we possess the relevant set of goals.

□ *Appraisal cycles 3a and 4a: ego-involvement and coping resources*

The second key question is: how does the process of secondary appraisal operate? In the proposed model, the process proceeds via the first branch of appraisal cycles. The third cycle would assess the level of ego-involvement and effectively say, "My survival goals are not being threatened," whilst the fourth cycle would assess the available coping resources by saying something along the lines of, "I am in a cinema and I am watching a fiction film."

To return to the 'biopsychosocial model of challenge and threat', Blascovich and Mendes's claim that 'viewing a scary film' is an example of a 'passive performance situation' is correct at the level of secondary appraisal. The authors propose that resource appraisals involve an assessment of the presence or absence of coping resources. Given that the resources inherent in the viewing situation outweigh the situational demands presented by the sequence, it is unlikely that we would experience a full-blown sense of threat.

(iii) Reappraisal (reflective appraisal)

According to the proposed model, the reappraisal stage re-assesses the meaning of the depicted situation *with respect to either the characters as protagonists or ourselves as viewers*. This move allows us to accept Lazarus's (1991) proposal that reappraisal serves to clarify the specific nature of the most appropriate emotion in the light of primary and secondary appraisals.

A consideration of the reappraisal stage allows us to understand the emotional impact of the fourth and final way of 'seeing' described in Chapter 2, by leading us once again to the intentional level of explanation. Following our discussion of conscious (attentive) processing, we should think of reappraisal as being equivalent to what Ekman (2003, p.24) describes as *reflective appraisal*. With respect to film viewing, reflective appraisal provides us with another example of *seeing-as (type II)* in the sense that it operates in a conscious, 'serial' fashion, emerging from a hierarchy of central processors operating in parallel. The subsequent feedback would either minimise or maximise the intensity of our negative responses 'within' the reduced range described previously, thereby determining that our emotional state is either a minimal or a maximal form of anxiety.

Frame 4.6: Influences on reappraisal: long shot from *The Beach* (2000)

□ *Re-adoption of goals: the role of motivational prompting*

The first key question is: why do we consciously re-assess the meaning of the depicted situation with respect to either the characters as protagonists or ourselves as viewers - effectively re-adopting the corresponding goals - when we know that the characters are only fictional and that we are not in danger? Although the automatic results of primary appraisal would be largely over-ridden by the discriminatory powers of secondary appraisal, a causal link between the film and a negative emotional response - made known to us by means of the body loop - would still remain. According to attribution theory, furthermore, we would causally attribute this response to the depicted situation as the most salient aspect of our environment. This point brings us to the role of *motivational prompting*. Given that negative arousal is unpleasant - almost by definition - it stands to reason that we will seek to reduce it in some way. With respect to our discussion of the paradox of horror, this proposal need not contradict the sensation-seeking hypothesis for we can add the following proviso: experiencing negative emotions is desirable if and only if we are provided with a suitable 'get-out clause'.

(1) Engagement strategies. The first option effectively goes *with* the grain and involves maintaining the causal link in question. As conscious and attentive beings, we can keep our eyes rooted on the screen and devote our processing resources to re-assessing the meaning of the depicted situation with respect to the characters as protagonists, whilst hoping that everything turns out for the best. We can think of this feedback as effectively *maximising* the intensity of our emotional responses 'within' the reduced range described, thereby determining that our emotional state is a maximal form of anxiety.[20] *(2) Detachment strategies.* The second option effectively goes *against* the grain and involves severing the link in question. As behavioural and cognitive beings, we can employ various coping strategies: for instance, we can look away from the screen or we can remind ourselves that what we are seeing is only a film. The employment of such strategies, however, is more likely in cases of graphic horror than in cases of non-graphic suspense. We can think of this feedback as effectively *minimising* the intensity of our emotional responses 'within' the reduced range described above, thereby determining that our emotional state is a minimal form of anxiety.[21]

In conclusion, we can propose a second functional relationship (see Figure 4.22): the higher the level of negative arousal (resulting from primary appraisal), the higher the probability of reappraisal taking place; that is, a reappraisal which is capable of either maximising or minimising the overall level of negative arousal.

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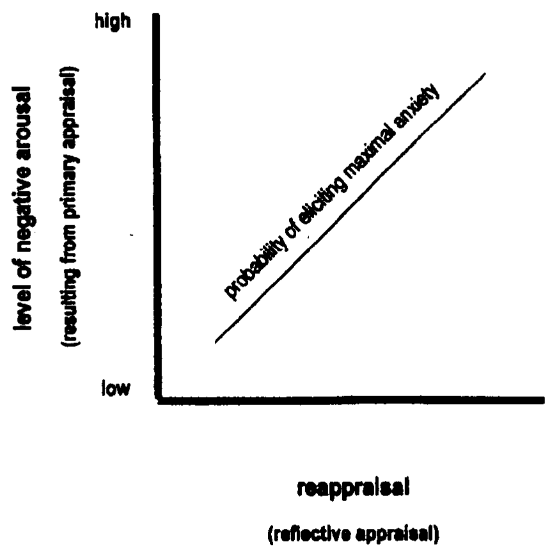
[20] Koriat et al. (1972) found that subjects who employed various *involvement strategies* whilst viewing the events depicted by stressful films generated greater psychophysical responses. Examples of such strategies included "I tried to imagine that it is happening to me." and "I tried to imagine that it is happening to somebody I know."

[21] In a series of experiments conducted by Lazarus and his colleagues in the 1960s (for example, Lazarus and Alfert, 1964) subjects were shown stressful films: one of these films documented a tribal 'rite-of-passage' ceremony in which adolescent boys underwent a surgical operation known as 'subincision'. Significantly, Lazarus and co. found that subjects who employed various detachment strategies whilst viewing the film reduced the intensity of their psychophysical responses. Examples of detachment strategies included telling oneself that the events in question were not as serious as they appeared (the 'denial' condition) and adopting the scientific perspective of an anthropologist (the 'intellectualization' condition).

Figure 4.22: Functional relationship II: the role of motivational prompting



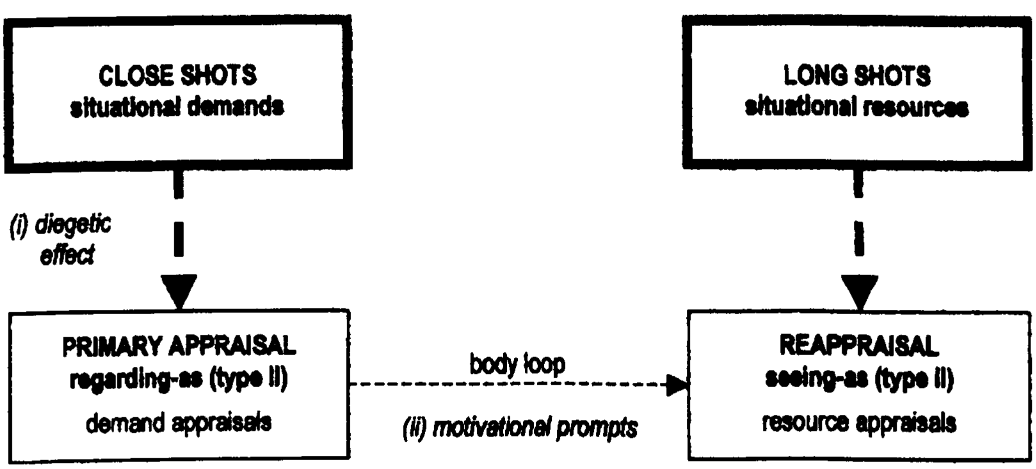
□ *Appraisal cycles 3b and 4b: ego-involvement and coping resources*

The second key question is: how does the process of reappraisal operate? In the proposed model, the process proceeds via the second branch of appraisal cycles. If we chose to employ engagement strategies, then the third cycle would re-assess the level of ego-involvement and effectively say, "The characters' survival goals are being threatened," whilst the fourth cycle would re-assess the available coping resources by saying something along the lines of, "The characters are in the middle of the sea with no means of protection." If, on the other hand, we chose to employ detachment strategies, then the third cycle would re-assess the level of ego-involvement by reiterating that, "My survival goals are not being threatened," whilst the fourth cycle would re-assess the available coping resources by reiterating that, "I am in a cinema and I am watching a fiction film."

Given that engagement is more central to our concerns than detachment, how is the threat to the characters' goals and the availability of coping resources dealt with by the sequence itself? First, we should offer a further explanation for why it may be more effective to 'leave something to the imagination': this explanation can be spelt out in terms of either the visibility or invisibility of the given threat and the corresponding employment or non-employment of cognitive coping strategies. Although the reality of a threatening object or event *which we are allowed to see* may by truly terrible, at least it has specific and definable limits; because we are aware of these limits, we can set about employing appropriate coping strategies. In the sequence, however, we are denied the view of the threatening object or event; therefore, this coping option is not available to us.

Second, both factors may be communicated in the ways described previously: the meaning inherent in the dialogue, situational cues, and the music track could be assessed at the level of conscious (attentive) processing. Certain filmic strategies, however, may specifically facilitate the reappraisal stage by making us aware of the absence of coping resources (see Figure 4.23). Following Françoise's disappearance, we are presented with a single long shot of Richard and Etienne: this shot serves to remind us that the three characters are still a mile or so from the island (see Frame 4.6, above). To return to the 'biopsychosocial model of challenge and threat', Blascovich and Mendes's claim that 'viewing a scary film' is an example of a 'passive performance situation' is problematic once again at the level of reappraisal. Significantly, the assessment of the absence of coping resources might be influenced by affective cues: for instance, a long shot of the open sea might be associated with being 'cut off' from safety. Given that the situational demands presented by the filmic world outweigh the situational resources available within it, we might experience a mild sense of threat.[22]

Figure 4.23: Reappraisal: the role of resource appraisals (and motivational prompting)



[22] Spielberg employs similar strategies in *Jaws*. In the opening sequence, the first underwater shot of the Watkins girl swimming - filmed from the shark's point-of-view - is followed by a long shot which reminds us that the girl is some distance from the shore. In the final section of the film - when Brody, Hooper, and Quint set sail in the 'Orca' in a final attempt to rid the island of the shark - Spielberg states that he was very careful to avoid catching the sight of land in the frame: "I wanted the audience to feel very cut off - like they couldn't just run back to shore because there was no shore to run back to."

4.4 CONCLUSION

(a) A secondary solution to the paradox of fiction

Having developed a multi-level model of the emotion system from both a connectionist and a functional perspective, we are now in a position to offer a secondary solution to the paradox of fiction. Let us continue with the task of revising the third proposition of the paradox and the Cartesian framework which underlies the paradox as a whole (see Table 4.5).

(i) The associative network route to (cinematic) emotion

In the first part of the chapter, we traced an *associative network route to (cinematic) emotion*, thereby enabling us to account for the impact of the (multiple) emotion cues presented by film. Following a consideration of associative and connectionist networks, we described the impact of three types of emotion cue: namely, diegetic cues, non-diegetic cues, and somato-visceral cues. Significantly, we found that the impact of these cues can be explained without making reference to existence beliefs (re. regarding-as, type I). From a connectionist perspective, shallow inputs resulting from the perceptual processing of emotion cues result in the activation of input nodes (perceptual memories) and event nodes (episodic memories) in an associative network; both processes can be understood in terms of parallel constraint satisfaction. (We also saw that all of these emotion cues may act as affective prompts for emotional imagery.)

(ii) The cognitive appraisal route

In the second part of the chapter, we traced a *cognitive appraisal route to (cinematic) emotion*, thereby enabling us to account for the meaning of the situations encountered by (goal-oriented) characters. Following a consideration of appraisal theory, we distinguished three types of appraisal. The notion of 'primary appraisal' has been related to the second way of seeing described in Chapter 2 (regarding-as, type II): it refers to the automatic, indiscriminate process which appraises the meaning of situations presented by film as if they were real and of personal significance, thereby producing 'appropriate' emotional responses. (In this instance, the absence of existence beliefs is compensated by the presence of the diegetic effect.) The notion of 'secondary appraisal', on the other hand, has been related to the third way of 'seeing' (seeing-as, type I): it refers to the 'globally sensitive' central process which appraises the representational and fictional status of the situations in question, thereby reducing the potential 'intensity range' of our emotional responses. Finally, the notion of 'reappraisal' has been related to the fourth and final way of 'seeing' (seeing-as, type II): it refers to the conscious, attentive process which appraises the depicted situation from the perspective of the characters, thereby either maximising or minimising our emotional responses 'within' the reduced intensity range described. (In this instance, the absence of existence beliefs is compensated by the presence of motivational prompts.)

Table 4.5: A secondary solution: revising the third proposition and the Cartesian framework

	induction stage	**reliance on existence beliefs / adoption of goals?**
(1) associative network route	input and event nodes - regarding-as (type I)	no: partial encapsulation / parallel constraint satisfaction
(2) cognitive appraisal route	primary appraisal - regarding-as (type II)	no: partial encapsulation / diegetic effect
	secondary appraisal - seeing-as (type I)	no: reliance on non-existence beliefs
	reappraisal - seeing-as (type II)	no: reliance on motivational prompting

N.B. The above scheme does not make reference to affective prompting.

(b) Further applications

So far, we have traced two different routes to the same primary emotion: namely, the associative network and cognitive appraisal routes to fear. In light of this, we need to demonstrate how the proposed model improves our understanding of other types of emotion - both primary and secondary - and how the two routes may perform contradictory functions.

(i) The primary emotion of sadness

How should we understand those subtler emotions which are not fundamentally related to survival? How, for instance, should we understand the primary emotion of sadness (and related emotions such as regret)? In order to answer this question, let us turn to a well-known scene from Ridley Scott's science-fiction drama *Blade Runner* (1982) - discussed by Carl Plantinga (1999) as an example of a 'scene of empathy'. It is the year 2019. Rick Deckard (Harrison Ford) is an ex-'blade runner' who is co-erced into tracking down and destroying a group of 'replicants' who have returned to Earth in a quest to prolong their short life-span. At the film's conclusion, the replicants' leader Roy Batty (Rutger Hauer) - in a reversal of roles - pursues Deckard across the dark and rain-swept rooftops of Los Angeles, before unexpectedly saving him from falling to his death. As Batty stands over the bewildered Deckard, it is uncertain whether he should be regarded as friend or foe. Our fears, however, are quickly assuaged by a different emotion altogether.

The subsequent exchange is presented by means of six shot/reverse shot 'couplets', the forward shot focusing on Batty who has seated himself on the rooftop (see Frame 4.7), and the reverse shot focusing on Deckard who lies exhausted (Frame 4.8). As the rain falls, Batty delivers a heart-felt speech, describing some of the incredible sights he has witnessed during his short life, before delivering the much-quoted line, "All those moments will be lost in time like tears in rain.", bowing his head and passing away. At this point, an inserted shot shows a white dove flying skyward, symbolizing a 'spirit' or 'soul' departing from Batty's body.

Frames 4.7 and 4.8: The primary emotion of sadness: *Blade Runner* (1982)

□ *The associative network route to sadness*

How should we understand our emotional response to this scene? Let us begin by tracing the *associative network route to sadness*. Starting with diegetic (personal) cues, arguably the most perceptually salient aspect of the scene is Batty's (Hauer's) face. Although the source of the water running down Batty's face is ambiguous, the phrase 'tears in rain' may index a facial indication of sadness. Other facial expressions are more clearly defined. An instant before saying the 'tears in rain' line, Batty displays a momentary wince of regret. With respect to the Facial Action Coding System cited above, this 'wince' can be analysed in terms of certain action units (see Table 4.6). (Another possible measure is eye position: the fact that Batty looks into the distance may be perceived as a sign of introspection.) Halfway through the line, Batty displays a frown (associated with seriousness) and a swallowing action (associated with crying). At the end of the line, Batty displays what could be described as a 'rueful smile' which - considering the resumption of eye-contact - is aimed at Deckard and seems to mark a momentary understanding between the two characters.

Table 4.6: Facial cues: possible action units (AUs)

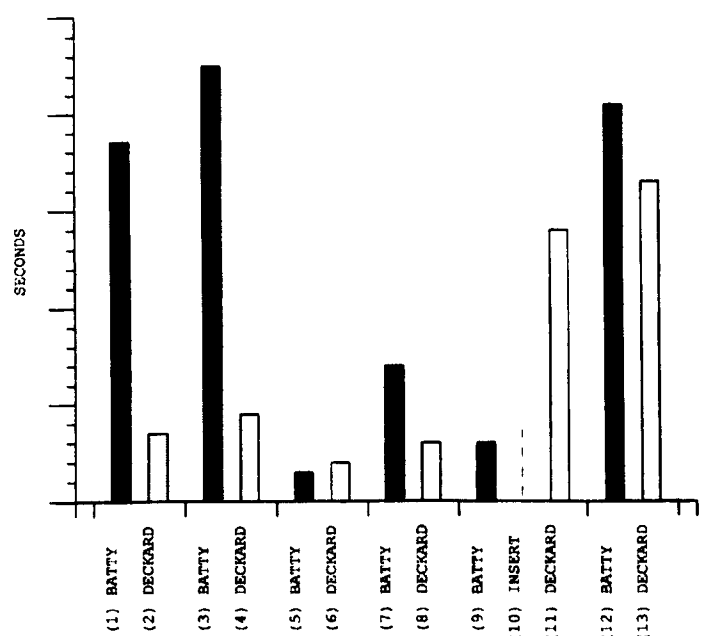
AU number	FACS name
4	brow lowerer
6	cheek raiser
12	lip corner puller
44	squint
45	blink

As we have seen, the processes of emotional communication and emotional elicitation can be explained in associationist (connectionist) terms: the individual expressions in question being 'recognized' by input nodes understandable as connectionist (pattern recognition) networks, and activating the 'sadness node' by means of associative connections. Plantinga argues, however, for an alternative, or less direct, means of emotional elicitation. Many theorists refer to *affective mimicry*: the tendency to (automatically) mimic the facial expressions of other people in our company. In addition, these theorists posit the role of *facial feedback*: the strong version of the 'facial feedback hypothesis' proposes that facial feedback is sufficient for emotional contagion, whereas the weak version proposes that facial feedback only gives rise to emotional contagion in conjunction with other emotional elicitors.

Given that Plantinga only subscribes to the weak version of the facial feedback hypothesis, he cites various strategies used by the film-maker to 'maximise the affective potential of the human face'. The first strategy is described as *attention*: 'catching' another person's emotions requires us to attend to their face in some way. Having established that Deckard and Batty are facing each other, the camera closes in on both characters - employing close-ups and shallow focus - thereby increasing the salience of their facial expressions. The second strategy is *duration*: emotional contagion takes requires time (see Figure 4.24). Some of the close-ups are of sufficient length in their own right, whilst the POV structure allows Batty and Deckard to be on screen for a total of around seventy and forty-five seconds respectively. (In the fourth and fifth couplets, the use of slow-motion emphasises the bowing of Batty's head and the departure of the dove on the one hand, and increases the salience of Deckard's response (a gulping action, a blink, and the fall of a raindrop / tear) on the other. In the sixth and final couplet, the rain falls around Batty's bowed head and our attention shifts to Deckard's sorrowful face.)

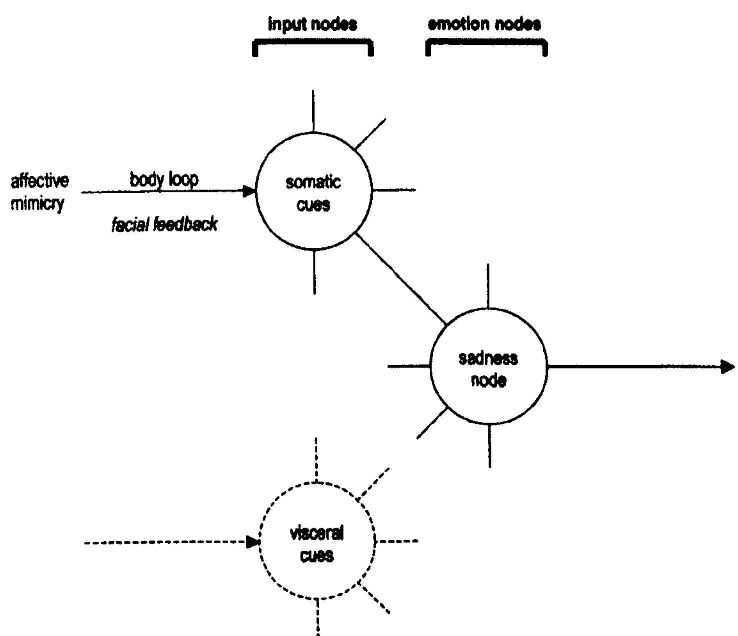
The final strategy is *affective congruence*: the 'affective potential' of a character's face is improved if it is presented in conjunction with 'congruent' images and sounds. Examples of diegetic (situational) cues include the grey/dark backgrounds and the sight and sound of falling rain: all of these cues may act as learnt triggers for a 'melancholic' response. The non-diegetic (musical) cues are provided by an evocative score written by Vangelis: following Anderson's account of 'cross-modal confirmation', the leading high notes of the synthesizer set the emotional tone and tend to coincide with the pensive pauses in Batty's speech. (The flight of the dove occurs in synchrony with the high notes of a synthesized xylophone, whilst the fall of the rain drop/tear from Deckard's face occurs in synchrony with the crash of a synthesized cymbal.)

Figure 4.24: Emotion contagion: the factor of duration



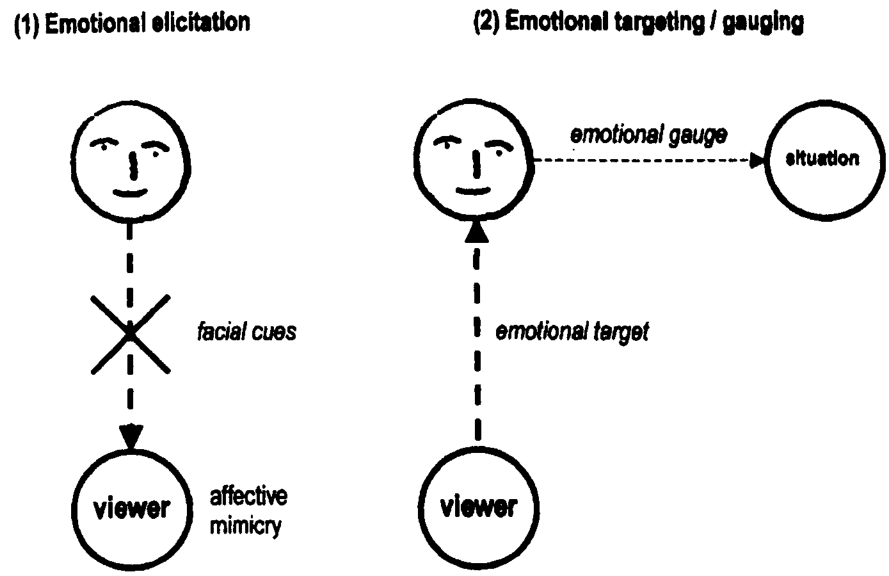
Elaine Hatfield et al. (1994) state that there is convincing evidence for both mimicry and feedback with respect to the face and the body. In spite of this evidence, they do not offer an explanation for why mimicry and feedback exert the influence that they do. Following the associative (network) account outlined above, however, an account of affective mimicry and facial feedback can be spelt out in associationist (connectionist) terms; indeed, this may be the only option available. According to Damasio, somatic feedback provides information about the movements of (striated) skeletal muscles; significantly, these muscles include those which comprise the face. If facial feedback is a type of somatic feedback, then it can be understood in terms of the impact of somatic cues (re. Figure 4.13). Given that Damasio regards the face as part of the body, these somatic cues would be presented to the network via the 'body loop' once again (see Figure 4.22). Crucially, the activation of corresponding 'input nodes' (or 'somatosensory maps') might lead to the activation of associated 'emotion nodes', thereby influencing our emotional state. Notice that this account constitutes an argument for the weak, as opposed to the strong, version of the facial feedback hypothesis.

Figure 4.25: Somato-visceral cues: the role of affective mimicry and facial feedback



In order to conclude our discussion of Batty's (Hauer's) face, a potential problem with Plantinga's account should be acknowledged. One could argue that Batty's facial expressions are too subtle to affectively mimic. Furthermore, his most salient expressions are the two (rueful) smiles, which, in purely perceptual terms, represent the antithesis of sadness. In a related fashion, Fridlund (personal communication) argues that if you removed Batty's face from the equation, you wouldn't lose that much. In contrast to both Plantinga and Fridlund, however, even if - both direct and indirect - emotional elicitation are potentially problematic, Batty's face may perform at least two crucial functions (see Figure 4.26). First, Batty's face may function as a *target* for our emotional responses: we require an intentional agent, preferably a (realistic) human one as a 'subject' for our (causal) attributions. Second, Batty's face may function as a *gauge* for measuring the appropriateness of our emotional responses: for instance, if Batty had burst into fits of hysterical laughter, we would have had cause to reconsider the meaning of the situation.

Figure 4.26: A reassessment of the affective role of the face



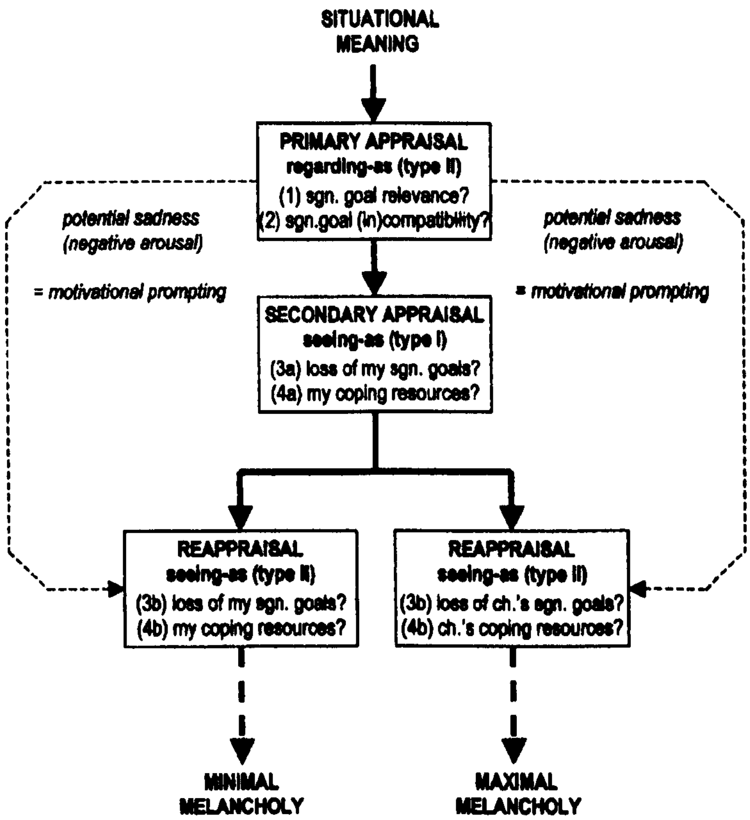
□ *The cognitive appraisal route to sadness*

The second route to sadness is the *cognitive appraisal route.* To recap, Oatley and Johnson-Laird (1987) propose that emotions occur when there is a 'juncture' (i.e., a critical moment) in either a goal or a plan: sadness occurs when a significant goal is 'lost'. Lazarus (1991, p.248) describes the core relational theme for sadness as 'not just loss, but *irrevocable loss.*' More specifically, the scene can be broken down into at least four formal structures: (1) the nostalgia of Batty; (2) the regret of Batty; (3) the death of Batty; and (4) the sorrow of Deckard. A key question is: how and why do we adopt the goals of either Batty or Deckard - as fictional characters - in the first place? Unlike the 'survival' goal structures underlying fear, the 'significant' goal structures underlying sadness, regret, and so forth, need not be on standby, readily brought into play by cinematic representations. A possible answer lies in the notion of 'cognitive identification' advanced by Grodal and others; this notion will be addressed in the following chapter (albeit in relation to the emotions of anxiety and concern).

For the time being, let us outline the basic relationship between the three appraisal stages (see Figure 4.27). According to the appraisal account, the automatic process described as primary appraisal (regarding-as, type II) would be responsible for the initial assessment of situational meaning. One of the scene's methods for communicating this meaning is through dialogue: the emotion of nostalgia is expressed in Batty's descriptions of the incredible sights he has witnessed, whilst the emotion of regret is expressed by the 'tears in rain' line. (In terms of vocal delivery, Batty's mid-sentence pauses might be taken as indications of pensiveness - hence, the phrase 'a pregnant pause'.) Another means of communicating situational meaning is through the music track. Following Anderson, Smith (1999) states: 'Through the process of cross-modal confirmation, the shared affective meanings of music and visuals direct attention to *shared formal features* which in turn reinforce and engender the affective meaning of the scene'. At the very least, the formal features of the music track seem to compliment the formal features of the scene as outlined above: for instance, a 'gentle' tone accompanies both the sudden change in the relationship between the two characters - animosity to intimacy - and Batty's verbal expressions of nostalgia and regret; the music 'builds' as Batty's death approaches.

The central process described as secondary appraisal (seeing-as, type I) would effectively reduce the potential 'intensity range' of our negative responses, thereby determining that our emotional state is not full-blown sadness, but, say, a form of melancholy - a congruent emotional state or mood. It is plausible, however, that residual arousal would operate as a motivational prompt, compelling us to reassess the meaning of the situation at the level of conscious (attentive) processing. Indeed, it is plausible that the reappraisal stage (seeing-as, type II) - in the form of engagement - would play a relatively substantial role, maximising the intensity of our melancholic responses *within* the reduced range. Our evaluation of the implications of 'moments being lost in time', for instance, would benefit from the greater sophistication and flexibility afforded by the highest level of processing: such an evaluation is a prime candidate for the frame problem, taking into account a variety of factors such as the irrevocable nature of the losses in question, the ceaseless nature of time, and the transient nature of life. In a related fashion, the cognitive appraisal route to sadness might interact with the associative network route in a number of interesting ways. Consider, for instance, our comprehension of both Batty's 'regretful wince' and 'rueful smiles'. The 'emotional range' would be established by an associationist-connectionist network (regarding the recognition of the wince and smile), whilst the 'emotional focus' would be provided by reappraisal (discriminating mental regret from physical pain, and negative ruefulness from positive happiness respectively).

Figure 4.27: The cognitive appraisal route to (cinematic) sadness: decision tree format



(ii) The secondary emotion of nostalgia

From a functional perspective, individual emotions can be thought of as 'modules'. Significantly, Power and Dalgleish (1997, pp.191-194) suggest that two or more primary 'emotion modules' can be combined to produce a *secondary emotion*. Integrating the results of the 'happiness' and 'sadness modules', for instance, may give rise to the emotion of *nostalgia*. How should we understand this particular combination and how might it apply to fiction film?[23]

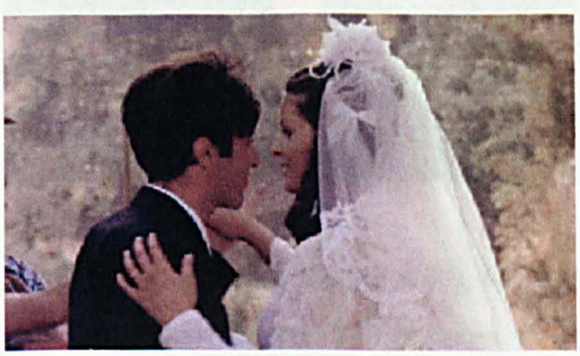
[23] Freeland (1999, p.81) defines 'the sublime' as a conflict between feelings of pain and pleasure: significantly, she proposes that 'such conflicts reflect the simultaneous operation of multiple emotion systems'.

□ *The associative network route to happiness*

In the final sequence from Francis Ford Coppola's *The Godfather, Part III* (1990), we are presented with two flashbacks from earlier in the trilogy. The first flashback is from *The Godfather* (1972) and features the scene described at the end of Chapter 3: we see Michael Corleone (Al Pacino) as a young man, dancing with his first wife Apollonia (Simonetta Stefanelli) during their Sicilian wedding (see Frame 4.9). The second flashback originates from *The Godfather, Part II* (1974): here, we see a still youthful Michael dancing with his second wife Kay (Diane Keaton) at a similar type of social gathering.

In this instance, the primary emotion of happiness might be generated via the associative (network) route to emotion. The associations in question would span both the real world and film. With respect to the first flashback, for instance, the social occasion of a wedding - and the emotion cues which it presents (smiling, dancing, and so forth) - might trigger a number of positive associations. Similarly, the sight of Michael as a young (and relatively uncorrupted) man and Pacino as a young (and relatively fresh-faced) actor might be perceived in a positive light. More intriguingly still, a viewer old enough to have seen the original film in 1972 might associate the scene with the positivity of their own youth. (Although happiness could be explicated in terms of the satisfaction of certain goals, it is not clear *what* or *whose* goals should be taken into account.)

Frame 4.9: The primary emotion of happiness: *The Godfather* (1972)



N.B. Repeat of Frame 3.7.

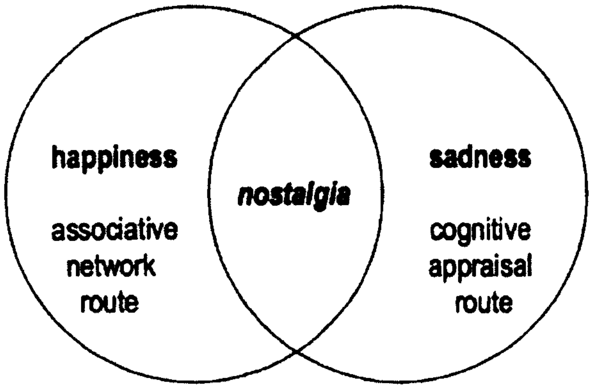
□ *The cognitive appraisal route to sadness*

After flashing backwards to the past, the film flashes forwards to the future. In the final two shots of the film, we see Michael as a lonely old man - his first wife deceased, his second wife divorced, and the rest of his family in tatters - sitting in a deckchair in his garden (see Frame 4.10). Given that the camera focuses on Michael's aged face, we are likely to interpret the preceding flashbacks as memories 'seen' from his psychological point-of-view. In this instance, the primary emotion of sadness might be generated via the sight of Michael as an old man and the cognitive appraisal route to emotion: our realisation that the events in question are in the past (and, therefore, beyond reach). This realisation would make reference to certain narrative / biographical information and involve an appraisal that certain significant goals have been lost - hence, the role of the propositional and schematic model levels of the mind. (Once again, a key question is: how and why do we adopt the goals of Michael - as a fictional character - in the first place? The older viewer, however, might partly appraise the scene as an indirect indication that their own youth has been and gone.)

Frame 4.10: The primary emotion of sadness: *The Godfather, Part III* (1990)

In the final stage of the process (see Figure 4.28), the happiness encapsulated by Michael's memories would be counterbalanced by the sadness of his (and our) realisation that the events in question are in the past (and, therefore, beyond reach); the two emotions would 'blend' - like the colours in a painter's chart - to produce the 'bitter-sweet' feeling we associate with nostalgia.

Figure 4.28: The secondary emotion of nostalgia



CHAPTER 5

Re-Tracing the Simulative Route to (Cinematic) Emotion: Emotional Constraints and Emotional Alternatives

CHAPTER 5

Re-Tracing the Simulative Route to (Cinematic) Emotion: Emotional Constraints and Emotional Alternatives

5.1 INTRODUCTION [1]

(a) Two approaches to the paradox of fiction

Having outlined and developed a multi-level model of the emotion system, we are in a position to address two issues which were introduced in the opening chapter and remain outstanding. Our first task is to relate one fundamental approach to another. Although the main strategy for solving the paradox of fiction is to revise the third proposition by demonstrating that emotions do not require existence beliefs, there are at least two ways of achieving this task. So far, we have explicitly focused on developing the direct approach to revising the third proposition, using Malcolm Turvey's (1997) seeing theory as a starting-point. In light of this, we need to redress the balance by explicitly focusing on the *indirect approach* as exemplified by what Nöel Carroll (1990) and others have described as the *thought theory*. Among other things, this will enable us to understand how we come to experience the subtleties and nuances of the emotional lives of fictional characters.

(i) The direct approach: the seeing theory

From a cognitive perspective, direct approaches begin with the world or the film, and trace a line of processing through the mind/brain; significantly, they do not make reference to existence beliefs in order to explain how our emotions are activated (although they make

[1] Part of this chapter was presented at the fourth CCSMI conference, Calvin College, Grand Rapids, Michigan, July 2004. Thanks to Nöel Carroll for his comments.

reference to *non*-existence beliefs in order to explain how our emotions are inhibited). In total, we have traced two 'direct routes' to (cinematic) emotion: one based on 'automatic association' (involving pattern matching) and one based on 'automatic appraisal' (otherwise known as primary appraisal). Although we have also traced two 'indirect routes' - represented by 'reflective association' (involving emotional imagery) and reflective appraisal (otherwise known as reappraisal) respectively - the 'indirectness' of these routes has not been the focus of the discussion.

(ii) The indirect approach: the thought theory

From the perspective of film theory, Carroll (1990, pp.88-96) advances the *thought theory* of emotional responses to fiction: according to this theory, we do not respond emotionally to the mistaken belief that the monster actually exists; rather, we respond emotionally to the thought of the monster, where the act of thinking is defined as the capacity to 'entertain a proposition non-assertively' - that is, without existential commitment. Murray Smith (1995b, p.118) proposes a similar solution to the paradox: for instance, we are not the unwitting subjects of some sort of delusion; rather, we 'imaginatively entertain' the scenarios which the fiction either describes or depicts. Carroll and Smith's thought theory also relates to Gregory Currie's (1995) *imagination theory*: following a similar line of reasoning, Currie proposes that we 'simulate' the scenarios presented by film along with the mental states of the featured characters.

Thought and imagination can be divided into two basic types (see Table 5.1).[2] According to the notion of *primary imagining*, we imagine a fictional situation 'impersonally' or 'acentrally'; that is, from a neutral, third-person perspective. Currie (ibid., p.152) describes primary imagining as 'imagining what is fictional in a story'. An example of this imaginative activity is *perceptual imagining*: we 'perceptually imagine' that the events depicted by a film are taking place. Although the thought theory assumes that we appraise the proverbial monster as 'threatening' and 'impure' in line with the character's view of the situation, Carroll makes a case for acentral imagining: he argues

[2] The distinction between 'central' and 'acentral imagining' is made by Wollheim (1987), p.103. Cited and summarised by Smith (1997), p.413.

that we 'assimilate' the situation as a whole, including both the monster and the character (emotional responses).[3]

According to the notion of *secondary imagining*, we can imagine a fictional situation 'personally' or 'centrally'; that is, from the perspective of a character. Currie (ibid.) describes secondary imagining as imagining 'various things *so as to* imagine what is true in the story'. An example of this imaginative activity is *imagining seeing*: we imagine that we are perceiving the characters and events depicted by the film from the perspective of an observer positioned within the filmic world - a phenomenon described by the *Imagined Observer Hypothesis* (IOH). Following the argument cited above, Carroll argues against central imagining, claiming that the psychoanalytical notion of 'identification' commits us to the problematic view that we enter into a 'mind-meld' with a given character by duplicating their mental states; his view of assimilation assumes that there is an asymmetry between the information appraised by ourselves as viewers and the information appraised by the character which results in asymmetrical mental states.

Table 5.1: The distinction between primary and secondary imagining

	perspective	**example**
(1) primary imagining	impersonal (acentral)	perceptual imagining
(2) secondary imagining	personal (central)	imagining seeing (see Imagined Observer Hypothesis)

How do the 'indirect' processes of imagination and thought relate to the more 'direct' processes described above? Smith (1995) challenges the everyday notion of 'character identification', integrating imagination and thought into an overall model of *character engagement* (see Table 5.2). According to this model, the 'structure of sympathy' (acentral imagining) comprises the components of *recognition*, *alignment*, and *allegiance*. To engage with a character, we must recognise them as 'an individuated and continuous human agent'; we must be aligned with them by means of the 'interlocking functions' of spatio-temporal attachment and subjective access; and we must feel an allegiance to them by morally approving of their actions, and so forth. Significantly, Smith also accounts for 'empathic phenomena' (central imagining), referring to the mechanisms

[3] For a discussion, see Smith (1995), p.78 and Grodal (1997), p.84.

of affective mimicry and autonomic responses (involuntary processes) on the one hand, and emotional simulation (a voluntary process) on the other.

Table 5.2: Smith's (1995) model of character engagement

	components	**sub-components**
(1) structure of sympathy (acentral imagining)	recognition	
	alignment	spatio-temporal attachment
		subjective access
	allegiance	moral orientation
		moral structure
(2) empathy (central imagining)	affective mimicry (involuntary)	
	autonomic responses (involuntary)	
	emotional simulation (voluntary)	

(b) Two approaches to the paradox of empathy

Our second task is to relate one fundamental paradox - and one fundamental aspect of our emotional lives - to another. Although the main conundrum with which we are concerned is the paradox of fiction - the paradox of why we respond emotionally to *fictional* characters and events - at this stage of the proceedings it will be illuminating to consider a related conundrum known as the *paradox of empathy* - the paradox of why we respond emotionally to actual people and events. To recap, Alex Neill (1996, p.175) defines empathy as the capacity to *feel with* another person, and sympathy as the capacity to *feel for* that person. (According to this distinction, the root *pathos* translates as 'feeling' period, whilst the prefixes *em-* and *sym-* translate as 'with' and 'for' respectively.)[4]

[4] This is a deliberate simplification. According to *Klein's Comprehensive Etymological Dictionary of the English Language*, the term 'empathy' is a loan translation of the German word *Einfühlung*, coined by the German philosopher Rudolf Hermann Lotze in *Mikrokosmus* (1858), whereas the term 'sympathy' originated in the moral philosophy of the 1700s. The root of both terms is *pathos*, meaning 'suffering' (or *Fühlung*, meaning 'feeling'); this root is qualified by either the prefix *em-* (from *ein-*) meaning 'in, into', or the prefix *sym-*, meaning 'together, like'.

As we have seen, the paradox of empathy can be spelt out in terms of three propositions, the third proposition stating that belief in the 'self-relevance' of a situation is necessary for an appropriate emotional response. Once again, the main strategy for solving the paradox is to revise the proposition in question by demonstrating that emotions do not require *relevance beliefs*. And once again, there are at least two ways of achieving this task. In the literature to date, the direct approach has been represented by associationism, whereas the indirect approach has been represented by simulation theory. To the best of my knowledge, theorists have not recognized the role of emotional appraisal.

(i) The direct approach: the associative route

In this section, I will review two theories of empathy which are, to my knowledge, representative of the current way of thinking. From the perspective of social psychology, Martin Hoffman (1984, 1987) proposes that empathetic responses are based on at least six different 'modes', the more basic modes preceding the more advanced ones both phylo- and ontogenetically (see Table 5.3).

Following Hoffman, Mark Davis (1996, p.13), classifies these modes as follows.[5] Starting with the 'non-cognitive' modes, an example of a *primary circular reaction* is a newborn baby's automatic response to the sound of another baby crying, whilst *motor mimicry* can be regarded as an automatic response to the sight of a target person's bodily (or facial) expressions. (Hoffman does not make a terminological distinction between motor mimicry and affective mimicry.) Moving on to the 'simple cognitive' modes, *classical conditioning* involves learnt responses to a specific type of stimulus (namely, the 'affective cues' of the target person), whilst *direct association* involves learnt responses to a general type of stimulus (for example, the cues presented by the target person's situation). Finally, with regard to the 'advanced cognitive' modes, *language-mediated association* involves learnt responses to related words and sentences. *Role taking*, on the other hand, is the act of imaginatively projecting oneself into the place of the target person. (Hoffman describes this imaginative activity as a voluntary process.)

How does Hoffman's multidimensional theory of empathy relate to the multi-level model of the emotion system outlined and developed above? At first glance, motor mimicry seems to be the odd one out in the sense that it appears to be a type of behaviour rather than a psychological process *per se*. As we have seen, however, ultimately an account of mimicry can be spelt out in associative terms. Similarly, one could argue that the distinction between, say, 'classical conditioning' and 'direct association' is an artificial one. Although the distinction between personal cues and situational cues may be of significance with respect to appraisal, there is no reason to believe that the mind/brain will treat the two types of cue as radically different cases in a purely associative sense. Finally, one could question the distinction between 'simple cognitive' and 'advanced cognitive'. Although language-mediated associations presuppose a certain level of cognitive development - namely, the grasp of a natural language - once this cognitive capacity is in place, the associative processes in operation may not differ greatly from those involved in standard cases of classical conditioning.

In summary, modes 1 to 5 are all instances of the *associative network route* to emotion; the key differences between these modes concern whether the stimuli in question are external or internal, specific or general, and analogical or symbolic in nature. The odd one out is not mimicry but role-taking (mode 6) which operates more clearly within the *simulative* (i.e., non-associative) realm; significantly, there is no role for emotional appraisal.

Table 5.3: Hoffman's (1984, 1987) multidimensional theory of empathy (revised)

<table>
<tr><th></th><th>original classification</th><th>mode
(independence from relevance beliefs)</th></tr>
<tr><td rowspan="5">(1) associative route</td><td rowspan="2">(1) non-cognitive</td><td>(1) primary circular reaction</td></tr>
<tr><td>(2) motor mimicry</td></tr>
<tr><td rowspan="2">(2) simple cognitive</td><td>(3) classical conditioning</td></tr>
<tr><td>(4) direct association</td></tr>
<tr><td rowspan="2">(3) advanced cognitive</td><td>(5) language-mediated association</td></tr>
<tr><td>(2) simulative route</td><td>(6) role-taking (voluntary)</td></tr>
</table>

From the perspective of communications research, Dolf Zillmann (1991) proposes a *three-factor theory of empathy*, based, in turn, on a three-factor theory of emotion. In his review of the literature on empathy, Zillmann cites the example of a target person caught in

[5] The six modes proposed by Hoffman form the second ('processes') stage of Davis's 'organizational model' of empathy.

an inferno (pp.136-140); he recognises that the subject is capable of responding to the target person's situation ('causal circumstances') *as well as* the target person themselves ('expressive elements'). The 'dispositional component' of empathy comprises our 'reflexive' (unconditioned) and 'learned' (conditioned) *behavioural* responses to the emotional states of the target person, an obvious example being motor mimicry. Similarly, the 'excitatory component' involves our reflexive and learned *physiological* responses to the aforementioned states, an example being an autonomic response. The 'experiential component', on the other hand, is broken down into three 'subcomponents': our emotional response to the target person undergoes 'appraisal' for 'hedonic parallelity' and 'monitoring' for 'appropriateness', before possibly serving as a trigger for 'role taking'.

How does Zillmann's three-factor theory of empathy relate to the multi-level model of the emotion system outlined and developed above? Zillmann (pp.143-144) indirectly acknowledges the shortcomings of the 'classical conditioning paradigm' by referencing Humphrey (1922), who 'suggested that in the absence of sufficient stimulus similarity, a *complex* integrating related percepts and sensations would be activated'. (Interestingly, Humphrey cites the example of a target person in danger of falling from a precipice, a scenario which resembles the case of the struggling climber to be discussed below. Is the 'complex' in operation here approximately equivalent to an 'appraisal pattern'?) For some reason, however, Zillmann does not (explicitly) encorporate these insights into his three-factor theory. Significantly, he only refers to 'appraisal' in the third stage of his model, in order to describe a cognitive process which effectively labels the empathiser's emotional response as either 'feeling with' or 'feeling for' the target person. According to Zillmann, therefore, empathy is mainly elicited by associative processes, and merely elaborated by appraisive (and simulative) ones.

Table 5.4: Zillmann's (1991) three-factor theory of empathy (revised)

	original classification	description (independence from relevance beliefs)
(1) associative route	(1) dispositional component (behavioural)	e.g., affective mimicry
	(2) excitatory component (physiological)	e.g., autonomic response
(2) simulative route	(3) experiential component (subjective)	(a) appraisal (b) monitoring (c) role-taking

N.B. The simulative route is represented by (3c) role-taking. Zillmann's three-factor theory resembles Smith's (1995) three-factor account of empathy.

(ii) The indirect approach: the simulative route

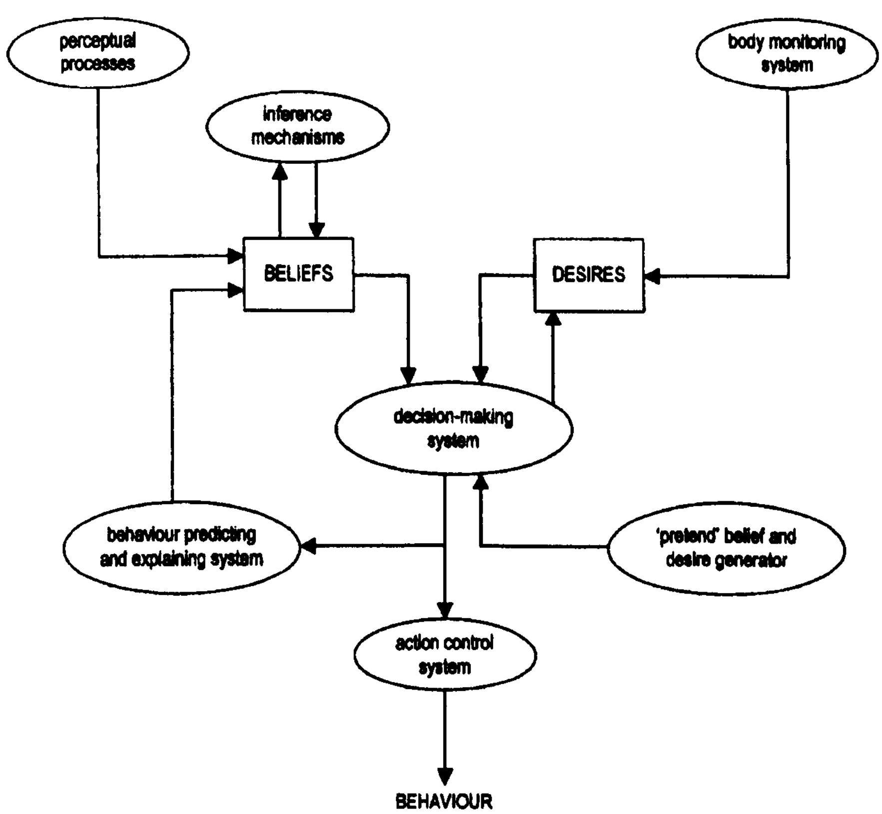
Having focused on the associative route to empathy, how should we understand the nature of the simulative route? This question brings us to a recent debate in the philosophy of mind: how do we gain an understanding of other people's minds and make sense of their behaviour? The arguments can be divided into two main camps.[6] In the previous discussion of the mind-reading system and the 'intentional stance', we touched upon the first position: according to *theory theory* (TT), we employ a (tacit) folk psychological theory about how people's beliefs and desires, for example, relate to their perceptions and behaviours. At this stage of the proceedings, we are in a position to introduce the second position: according to *simulation theory* (ST), we simulate the target person's beliefs and desires, feed the resulting states into our 'decision-making system', allow the system to run 'offline', and then see what the system comes up with. The simulative route to 'behaviour prediction' is described in visual, boxological terms by Stephen Stich and Shaun Nichols (see Figure

[6] For a discussion of the TT versus ST debate see the twin anthologies *Folk Psychology* and *Mental Simulation* (1995) edited by Martin Davies and Tony Stone. The articles most commonly cited - and included as the first three chapters of the first volume - are by Jane Heal (1995a), Robert Gordon (1995a), and Alvin Goldman (1995a).

5.1). With respect to cognitive film theory, Currie's (1995, Ch. 5 and 6) account of the imagination can be understood in these particular terms.

The TT versus ST debate is a complex one. From our perspective, two aspects of the simulation account are of particular significance. *Key point 1.* Currie (ibid., pp.151-152) argues that the claim that 'imagination is simulation' is not an instance of conceptual analysis akin to the claim that 'a bachelor is an unmarried man'; rather, the claim is in line with the *essentialist identification* that (apparently continuous) water actually consists of (discontinuous) H_2O molecules. This essentialist claim can be approached from the opposite direction by appealing to the notion of *emergence*: for instance, from H_2O molecules 'emerges' the fluidity of water. *Key point 2.* Currie (p.161) argues that 'simulation, if it really does help us to understand the minds of others, must be done unintentionally, mostly at a subconscious level'.

Figure 5.1: The simulative route to behaviour prediction



Based on Figure 5.3 from Stich and Nichols (1995), 139.

Given, however, that empathy has been defined as the capacity to 'feel with' a target person, it is less a case of our simulating that person's decision-making and more a case of our simulating their emotional states (see Figure 5.2). In the 'simulation-based account of empathy' described by Nichols et al. (1996), desires are removed and the decision-making system is replaced by an 'emotional response system' alone. Many theorists, however, claim that emotions are dependent on both beliefs and desires; negative emotions, for example, come about when there is discrepancy between what we believe the world to be on the one hand, and what we desire the world to be on the other (see Currie, 1990, Ch. 5). In addition, there is an important distinction to made between a system which appraises such discrepancies, and a system which initiates the emotional responses themselves. In light of these considerations, I have added both *desires (real and pretend)* and an *emotional appraisal system* to Nichol et al.'s model. With respect to cognitive film theory, Smith's (1995, pp.96-98) account of 'emotional simulation' can be understood in these particular terms.[7]

In the case of empathy, we must consider two groups of arguments from the TT versus ST debate. *Key point 3.* The first group of arguments is *against* simulation theory (and thereby *for* theory theory) and can be expressed as a single question: namely, how does simulation begin? The theory theorist might object that simulating another person's emotions depends on us having some sort of folk psychological theory about what those emotions are. As we will see, simulation theorists propose that simulation begins with the external world; in the case of film viewing, the external world is the film itself. *Key point 4.* The second group of arguments is *against* theory theory (and thereby *for* simulation theory): how does folk psychology bridge the gap between theory and experience? The simulation theorist might argue that the activity of theorising about another person's emotional states does not lead to the experience of those emotions; the activity of simulating another person's emotional states, however, seems to entail some kind of emotional experience almost by definition.

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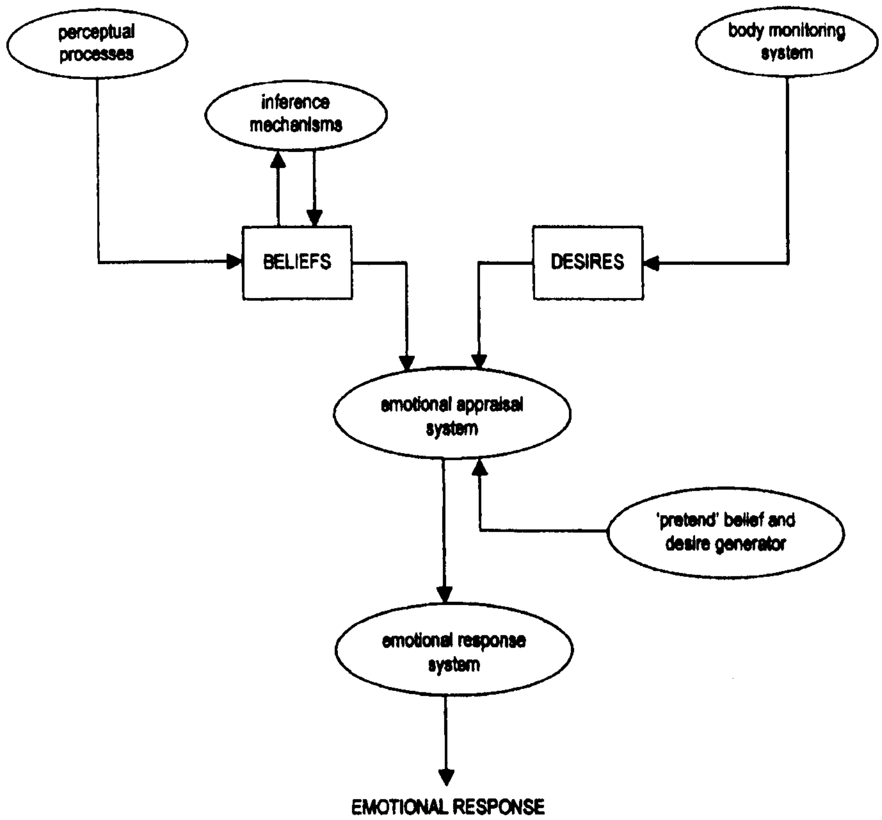
[7] In order to illustrate this process, Smith cites the work of one of the main proponents of simulation theory: Gordon (1987, pp.152-153) proposes that 'our emotion-producing system may be run off-line, disengaged from its natural input and output systems'.

Figure 5.2: The simulative route to empathy



Based on Figure 4.3 from Nichols et al. (1996), p.61.

* * *

In brief, my aim in this chapter is to address our 'indirect' relationship to the world and the cinema, thereby offering what could be described as a *tertiary solution* to the paradox of fiction. My approach, however, will be slightly unconventional. With respect to simulation in general, I do not wish to argue that we are incapable of imaginatively entertaining any of the scenarios presented by real world and filmic situations (or any of the mental states held by actual persons and characters). In this respect, the proverbial sky may be the limit; as Currie (1995, p.170) acknowledges, '[p]eople can imagine just about anything'. With respect to emotional simulation in particular, however, it is my contention that we should regard appeals to the imagination as something of a last resort.

From a theoretical perspective, on the one hand, it is precisely because the sky *is* the limit that we should search for more concrete alternatives whenever possible; as Neill (1996, p.185) acknowledges, 'appeals to imagination are all too often a signal that explanation has come to an end'. From a practical perspective, on the other hand, it is precisely because the sky is *not* the limit that we should be aware of the various constraints in operation; although we may be capable of imagining just about anything - in a perceptual and a cognitive sense - it seems that we cannot switch our emotions on and off with the same degree of freedom. Before appealing to the role of emotional simulation, therefore, we should consider at least two questions: first, to what extent does the multi-level model of the emotion system outlined thus far act as a 'constraint' on emotional simulation?; and second, to what extent does the multi-level model act as an 'alternative' to emotional simulation? The first question will be addressed by reconsidering the associative network route to (cinematic) emotion, whilst the second question will be addressed by reconsidering the cognitive appraisal route to (cinematic) emotion.

5.2 ASSOCIATION AS A 'CONSTRAINT' ON SIMULATION

(a) A neurobiological perspective

To begin our re-evaluation of the simulative route to empathy, we need to consider the perceptual workspace of the mind (the first half of Fodor's dichotomy). In particular, we must examine cases of empathy in which we are allegedly required to replicate certain *perceptual states*: according to popular definition, for instance, imagination typically involves mental imagery - especially of the visual variety.[8] The key question is: to what extent does the multi-level model of the emotion system outlined thus far act as a 'constraint' on this particular type of emotional simulation? In the following discussion, this question will be addressed by reconsidering the associative network route to (cinematic) emotion. Our first task is to address the distinction between *primary* and *secondary imagining* as outlined above; in order to do this, we will need to develop our understanding of the associative network route by taking a primarily neurobiological perspective.

[8] Currie and Ravenscroft (2002, Ch. 5) make a distinction between perceptual and propositional forms of imagination. The propositional form will be discussed in section 5.3.

(i) Primary imagining

The main argument can be established by considering the case of primary imagining. To recap, Currie states that an example of primary imagining is *perceptual imagining*: we 'perceptually imagine' the characters and events depicted by a film from an impersonal (acentral) perspective. He goes on to propose that the relationship between perceptual imagination and our perception of the film itself is one of *counterfactual dependence*. How should we understand this proposal? In reference to his blue eyes, the actor Paul Newman once joked: "I picture my epitaph: 'Here lies Paul Newman, who died a failure because his eyes turned brown.'" Consider our perceptual imagining of Newman's character Prof. Michael Armstrong in Hitchcock's *Torn Curtain* (1966) (see Frame 5.1): this perceptual imagining is counterfactually dependent on the blueness of his eyes - as well as the other features of his appearance - in the sense that if Newman's eyes really had 'turned brown', then our perceptual imagining would have differed accordingly.

Frame 5.1: Primary imagining: *Torn Curtain* (1966)

We can arrive at a different understanding of the relationship between perception and perceptual imagining by returning to a neurobiological perspective and by considering what Currie and Ravenscroft (2002, p.67) describe as the *implementation hypothesis*.[9] Stephen Kosslyn (1994, p.76) proposes that (high-level) vision and visual imagery 'share' -

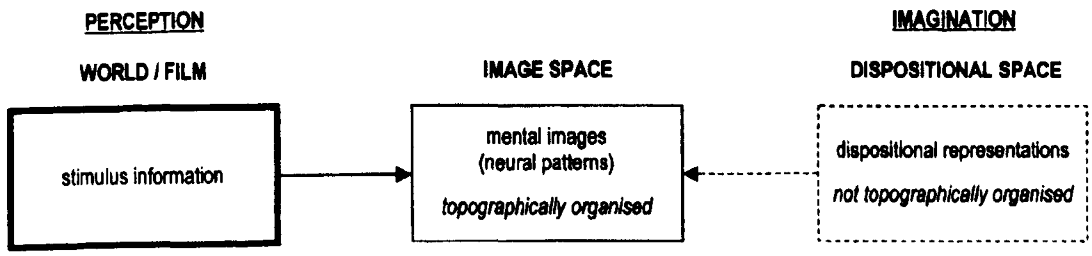
[9] The relationship between vision and visual imagery is addressed by Currie (1995b), whilst the relationship between motor performance and motor imagery - not considered here - is addressed by Currie and Ravenscroft (1997). Some of the findings of these two papers are brought together in Currie and Ravenscroft (2002, Ch. 4). Following more recent research by Kosslyn (1997), they reassess the implementation claim with respect to vision and visual imagery but argue that there is still evidence of a 'substantial overlap' between the two.

or are implemented by - 'common mechanisms'. This proposal can be developed as follows. Following the research of Kosslyn et al. (1993), Damasio (1994, Ch. 5; 1999, App.) discusses the neurobiological relationship between perception on the one hand, and imagination and memory on the other (see Figure 5.3). He proposes that our mental images are based on 'neural patterns'; these patterns are 'topographically organised' and realised in early sensory cortices - otherwise known as the *image space*. (Significantly, the term 'mental image' does not does not refer exclusively to either a visual or a static phenomenon: images can be realised in any sensory modality, including the auditory and the somatosensory.)

The formation of a *perceptual mental image* - for example, a 'percept' of Newman's character - would be triggered in a direct, 'bottom-up' fashion by the external world of Hitchcock's film. As we have seen, this process would begin with sensory signals from the sensory receptors (or transducers). Conversely, the formation of a *recalled mental image* - i.e., our memory or imagination of Newman's character - would be triggered in an indirect, 'top-down' fashion by dispositional representations (or 'firing patterns') in the internal world of the mind/brain. These representations are not topographically organised and are stored in 'convergence zones' in, for example, higher-order cortices - otherwise known as the 'dispositional space'. The crucial point, however, is that both perceptual and recalled mental images are ultimately formed in the *same* 'image space'.

In conclusion, Damasio's neurobiological account suggests that the relationship between perception and perceptual imagining is one of *mutual exclusivity*: if our perception and perceptual imagining of Newman's character involve the *same* networks or 'nodes' in the mind/brain - the main difference being the 'source' of the activation (external versus internal) - then perhaps the 'presence' of the one is only necessary (or possible) in the 'absence' of the other. Considering, then, that Hitchcock's film presents us with a continual stream of (external) perceptual information, the activity of (internal) perceptual imagining may be largely superfluous. (In addition, we may not be given the opportunity to perceptually imagine the scenarios presented to us, the continual stream of new information 'soaking up' our processing resources.)

Figure 5.3: Image space vs. dispositional space



(ii) Secondary imagining

This particular line of argument can be strengthened by turning to the case of secondary imagining. To recap, Currie (1995) states that an example of secondary imagining is *imagining seeing*: we imagine that we are perceiving the characters and events depicted by the film from the personal (central) perspective of an observer positioned within the filmic world - a phenomenon described as the *Imagined Observer Hypothesis* (IOH). Although Currie (ibid., pp.170-171) rejects imagining seeing / IOH as a 'general thesis', he concedes that certain shots 'encourage' such an imaginative activity. In this respect, he cites the famous zoom-dolly shot used in Hitchcock's *Vertigo* (1958) to depict the vertiginous experiences of John 'Scottie' Ferguson (played by James Stewart) - a retired San Franciscan policeman who suffers from acrophobia (see Frame 5.2). In reply, Smith (1997, p.422) argues: 'Surely the zoom-dolly effect is no more an exact replication of how vision appears to one experiencing vertigo than is a POV shot an exact replication of ordinary vision.'; in other words, the rule - as well as the exception - may encourage the imaginative activity in question.

From our perspective, the main challenge to IOH is to apply Ockham's razor - the philosophical maxim which states that 'entities are not to be multiplied beyond necessity'. Indeed, IOH is a classic case of where Ockham's razor should be wielded with a vengeance.[10] Although neither Currie nor Smith propose that either type of shot 'mandates' imagining seeing, both seem to overlook two fundamental points. First, in the real (immediate) world, we only see situations through our own eyes: perhaps, then, this constitutes a 'default setting', as it were, of our perceptual system. Second, Hitchcock does

[10] Conversation with Richard Allen and Warren Buckland. In a conference paper presented at the third CCSMI conference, Buckland (2001) attempts to revive IOH.

not simply present Scottie's view from the top of the stairwell and rely on the viewer to simulate vertigo: the combination of a forward zoom and a reverse tracking shot creates *two* sets of *conflicting* 'optic flow patterns' which (presumably) 'specifies' the appropriate visual experience. Conversely, consider Scottie's views of the streets of San Francisco during his solitary drives around the city, and his longing glances at Madeleine / Judy (Kim Novak) as the object of his obsession: these shots present us with only *one* set of optic flow patterns, thereby specifying a relatively ordinary visual experience. In both cases, however, our visual system will analyse the optic array - through modular and computational processing - and inform other systems of the mind of either an exceptional or an ordinary state of affairs (re. shallow outputs). In light of this, there is no need to posit the 'entities' of either 'imagining seeing' or 'perceptual imagining'; such a challenge is only 'uneconomical' in the sense that we still do not fully understand how the visual system processes optical information.

Frame 5.2: Secondary imagining: *Vertigo* (1958)

(b) A connectionist perspective

Our second task is to address certain objections aimed at Carroll and Smith's thought theory; defending the thought theory in certain respects will demonstrate how thought and imagination are constrained in others. First, Turvey (1997, pp.432-441) argues that the thought theory's appeals to thought and imagination relegate the film to the status of a dispensable vehicle for perceptual information, whilst failing to explain why our emotional responses when actually watching a film are 'more *intense*' than our emotional responses when, say, we think about the film's subject matter after we have left the cinema. Second, Berys Gaut (1997) argues that Smith's account of central imagining conflates emotional simulation with affective mimicry and autonomic responses. (In reply, Smith, 1997, pp.416-417, proposes that affective mimicry and autonomic responses function as *affective prompts* for emotional simulation, enabling us to imagine - in a more 'vivid' fashion - what it would be like to be in the character's situation.) In order to defend the thought thoery against both of these objections (and support Smith's reply), we will need to develop our understanding of the associative network route by returning to a connectionist perspective.

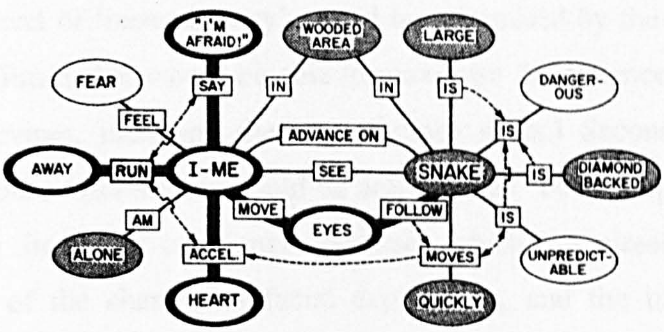
(i) Emotional media and emotional imagery

Peter Lang (1984) proposes an associative network model of memory and emotion (see Figure 5.4). For any given scenario, we can think of there being a cluster of relevant propositions in associative memory; depending on the universality of the situation and people's background and experience, some people's memory will contain more relevant propositions than others. These propositions can be divided into three basic types. Think back to the situation of being confronted by a threatening animal. First, *stimulus propositions* would encode information relating to the physical appearance of the animal and the environmental context in which such animals are usually found. Second, *response propositions* would encode somatic, visceral, and phenomenological information relating to the physiological, behavioural, and subjective responses of, say, a person unfortunate enough to encounter a shark whilst swimming in the sea. Third, *meaning propositions* would encode conceptual information relating to the emotional significance of such an encounter (e.g., 'sharks are potentially dangerous'). Activation of the network (as a 'unit') is dependent on a *critical number* of 'matching' input propositions; if the network is activated, then the relevant 'visceral' and 'somatomotor programs' will be run as output.

With respect to emotional media and emotional imagery, Lang describes four potential factors which 'determine' the activation of an emotion network; the first two factors are of particular relevance to the current discussion. The first factor relates primarily to stimulus information: 'In general, the more complete and consistent the stimulus information matches the [emotion] prototype, the more likely it is that the emotion response program will be accessed and run.' According to this factor, a real world situation is more likely to elicit emotion than its filmic counterpart, whilst analogical media (film, television, and so forth) are more likely to elicit emotion than propositional media (spoken or written accounts). The second factor relates primarily to response information:

'Degraded stimulus input is more likely to access the [emotion] prototype if other propositions in the prototype are independently instigated.' This factor can be illustrated by referring to a group of experiments - conducted by Lang et al. - in which subjects were asked to imagine the emotional events described in propositional form by written scripts: the subjects who were given scripts which included both 'stimulus propositions' and 'response propositions', generated greater emotional responses - as measured by verbal reports and physiological tests - than those who were given scripts containing stimulus propositions alone.

Figure 5.4: Lang's (1984) associative network model of memory and emotion



(ii) Reconciling the seeing and thought theories

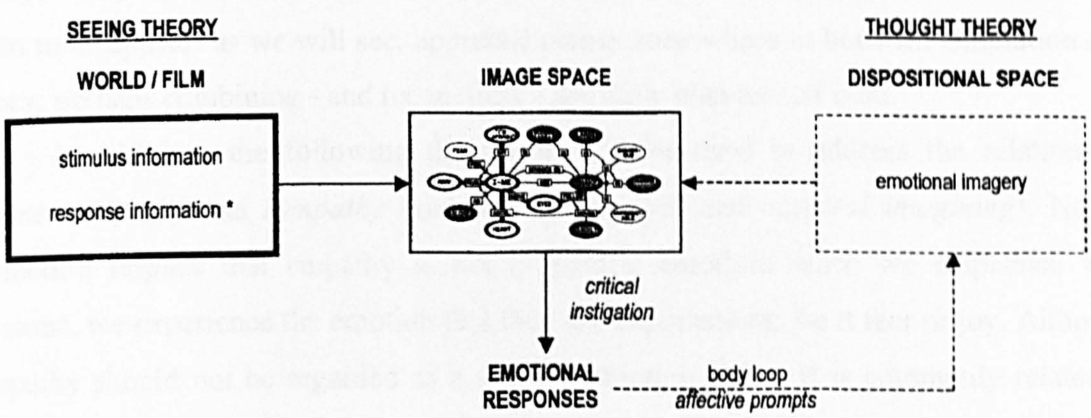
A combination of Lang's associative network theory with Damasio's neurobiological account allows us to reconcile Turvey's seeing theory with Carroll and Smith's thought theory. In particular, it allows us to defend the thought theory against Turvey's objection that appeals to imagination relegate the film to the status of a dispensable vehicle for perceptual data, whilst (in answer to Gaut's objection) allowing us to spell out Smith's notion of an 'affective prompt' in more literal, causal terms. Think of the main scenes of empathy discussed thus far. The scenes centring on fear stimuli have included Indiana Jones being confronted by the snake in *Raiders of the Lost Ark*, Ripley being confronted by the monster in *Alien*, and the soldier lying wounded on Omaha Beach in *Saving Private Ryan*. The scenes centring on emotion cues and the appraisal of situational meaning have been represented by the Watkins girl in *Jaws* and the three characters from *The Beach* being confronted by either an unseen or a non-existent shark. Finally, the scenes centring on different emotions altogether - sadness, regret, and so forth - have been represented by Roy Batty in *Blade Runner* and Michael Corleone in *The Godfather, Part III* contemplating their own mortality.

For each of the depicted scenarios, we can think of there being an *image space* - located in sensory cortices - which contains an associative network of related nodes (see Figure 5.5). Starting with the seeing theory, each associative network could be activated in a direct, bottom-up fashion by the external world of the film. First, the nodes which correspond to *stimulus information* would be activated by the features of the threatening creature, the facial, bodily, and vocal expressions of the threatened character, and so forth. As we have seen in our discussion of equivalent and non-equivalent information, the level of 'completeness' would be maximised by the size, shape, and so forth, of the projected image, whilst the level of 'inconsistency' would be minimised by the viewing conditions. (Furthermore, the film-maker would be able to maximise the salience of this information through various devices, including the use of close shots.) Second, the nodes which correspond to *response information* would be activated by 'body looped' somato-visceral feedback, resulting from any emotional responses which are already in play and our affective mimicry of the character's facial expressions, and the like. (Some of these emotional responses might be generated by an appraisal of situational meaning.) If a 'critical number' of input nodes was activated - or the nodes were activated to a critical level - then the network would be accessed as a unit, thereby generating appropriate emotional responses.

Moving onto the thought theory, the same image space - and the same associative networks - could be activated in an indirect, top-down fashion by the internal world of the mind/brain: for each of the depicted scenarios, we can think of there being a *dispositional space* - located in higher-order cortices - which underlies our capacity to (deliberately) conjure up appropriate emotional imagery. Significantly, this imaginative capacity would be dependent on the film in two ways. First, the emotional responses just described would operate as affective prompts, encouraging us to imagine what it would be like to be confronted by a threatening creature, to be stranded in the middle of the ocean, to be lying wounded on a beach thousands of miles from home, and so forth. (More precisely, the verb 'to prompt' could be spelt out in terms of the verb 'to activate': both the nodes for stimulus and response information would send activation to appropriate 'memory structures' and 'thought patterns' via associative connections in accordance with the phenomenon of thought congruity described by Bower and others.) Second, although the entertaining of such imagery would result in the activation of nodes in a corresponding associative network, our capacity to respond emotionally to such imagery would be dependent on the overall activation of a *critical number* of such nodes, many of which would be brought into play by the film itself.

In light of this account, what would happen after we left the cinema? Say we try to 'imaginatively entertain' the content of the scenarios in question. With respect to stimulus information, Damasio's research suggests that our merely imagining this content would involve the activation of the aforementioned 'nodes'; significantly, however, these nodes would not be activated to the same extent (although related brain regions might be activated more strongly - see Currie, 1995b, p.31). With respect to response information, furthermore, emotional responses (especially, startle responses) and affective mimicry tend to be triggered by 'external', as opposed to 'internal', stimuli; therefore, the corresponding nodes might not be activated at all. Given that a critical number of nodes would not be activated - and the impact of affective prompts would be severely reduced - our post-film imaginings would be less likely to generate emotional responses of an intensity which compared to that of the original viewing experience (as noted by Turvey).

Figure 5.5: Reconciling the seeing and thought theories



5.3 APPRAISAL AS AN 'ALTERNATIVE' TO SIMULATION (AND THEORY)

(a) Two cases from the real world

To complete our re-evaluation of the simulative route to empathy, we need to consider the central workspace of the mind (the second half of Fodor's dichotomy). In particular, we must examine cases of empathy - from both the real world and the cinema - in which we are allegedly required to replicate a target person's *propositional attitudes*: for instance, their *beliefs* about how the world happens to be and their *desires* about how the world should be. The key question is: to what extent does the multi-level model of the emotion system outlined in the previous chapters act as an 'alternative' to this particular type of emotional simulation? In the following discussion, this question will be addressed by reconsidering the cognitive appraisal route to (cinematic) emotion, and by appealing once again to a cognitive (and intentional) level of explanation. In order to fully understand the status of appraisal theory (AT) as a suitable alternative, we must consider the debate between simulation theory (ST) *and* theory theory (TT): viz., as mind-readers and empathisers, do we simulate other people's mental states, do we theorise about their mental states, or do we appraise their situations (as if they were our own)? In the light of appraisal theory, many of the clear-cut distinctions between simulation theory and theory theory begin to disappear: as we will see, appraisal comes somewhere in between simulation and theory, perhaps combining - and reconciling - the basic elements of both.

In addition, the following discussion will be used to address the relationship between *empathy* and *sympathy* (and between *central* and *acentral imagining*). Neill's distinction implies that empathy is not a specific emotion; when we empathise with someone, we experience the emotion that they are experiencing, be it fear or joy. Although sympathy should not be regarded as a specific emotion either, it is commonly related to emotions with negative hedonic valence: for instance, it feels unnatural for us to say that we sympathise with a person who is in a state of joy. (In virtue of this fact, the term 'sympathy' covers a smaller range of emotions than the term 'empathy'.) Considering that the aim will be to spell out possible connections *between* empathy and sympathy, the primary focus will be negative, as opposed to positive, emotions. In a related fashion, the discussion will touch upon the relationship between *egoism* and *altruism*. In the way that it seems unreasonable to say that we feel concern for a joyful person, it also seems unreasonable to say that we feel obliged to help that person overcome their joy (unless, of course, we begrudge them their good fortune). Thus, it is plausible that altruistic behaviour is motivated primarily by negative emotions.

(i) The case of the struggling climber
(default mode 1: perceptual access)

In a discussion of empathy, the philosopher Ian Ravenscroft (1998) describes the time he witnessed a rock climber 'struggling with an overhang' and about to fall to his death. Ravenscroft states that he 'vividly experienced' what it was like to be in the climber's situation. A filmic counterpart would be viewing Kevin Macdonald's *Touching the Void* (2003), a recent documentary about two British men who successfully climbed a mountain in the Peruvian Andes in 1985, before facing a series of equivalent ordeals on their descent (see Frame 5.3). Why is it plausible that we would respond emotionally to the fate of the anonymous climber in the first instance, or the fate of either Joe Simpson or Simon Yates in the second, as people who exist separately - in physical, kindred, and platonic terms - from ourselves?

Frame 5.3: The case of the struggling climber: *Touching the Void* (2003)

N.B. Repeat of Frame 1.3.

Ravenscroft briefly acknowledges the role of the associative route to emotion, by citing the mechanism of classical conditioning: obvious examples would include the climber's facial, bodily, and vocal expressions of fear, pain, distress, and so forth. His main concern, however, is the theory theory (TT) versus simulation theory (ST) debate. Ravenscroft suggests that the only way that theory theory could bridge the gap between theory and experience is as follows: we employ a folk psychological theory in order to make mental state attributions and each of these attributions is causally linked to an experiential state. In the case in question, then, we theorise about what emotions the climber is experiencing, and our subsequent attributions cause us to actually experience these emotions. Ravenscroft rejects this solution on the grounds that it posits, and 'duplicates', causal pathways beyond the realms of plausibility. Instead, he argues for a version of simulation theory, claiming that we 'imaginatively identify' with the climber's situation by simulating his perceptions, beliefs, and desires. In an attempt to defend theory theory by bridging the theory/experience gap, Frederick Adams (2001) suggests that our perception of the climber's situation triggers memories of analogous situations and related experiential states; subsequently, we employ a folk psychological theory and fill in the resulting 'd-that' clauses with the appropriate qualia.

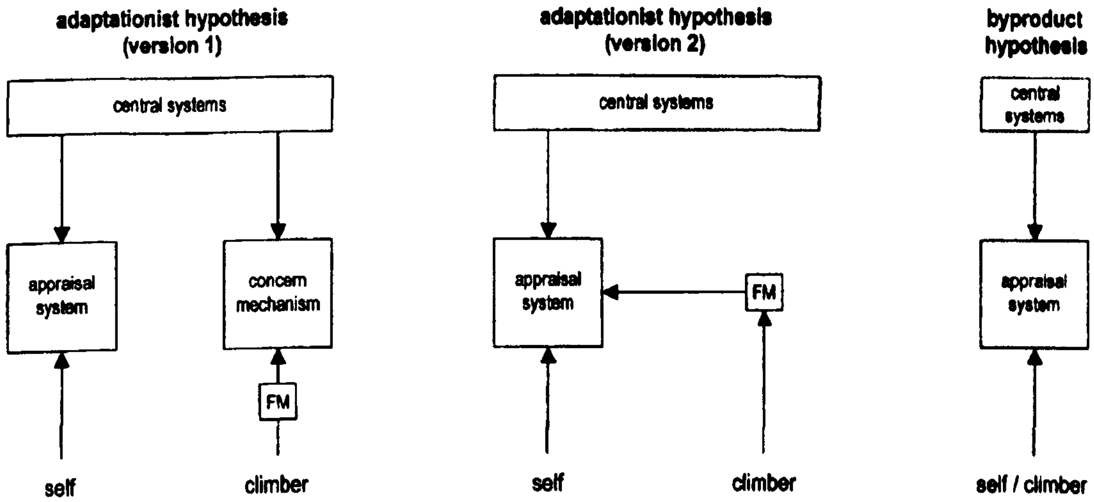
Although the associative-type solution proposed by Adams and the simulative-type solution proposed by Ravenscroft are both plausible, both authors overlook a possible alternative. Imagine, instead, that you are the unfortunate climber. It seems reasonable to say that if you were really staring death in the face in the manner described, you would not need to rely on either emotion cues in an associative sense or exercises of the imagination in a simulative one. Rather, you would *cognitively appraise* the meaning of the situation with respect to your goals and concerns, and you would respond fearfully. And we should not think of this appraisal process as being either slow or deliberative in nature. For some reason, neither Ravenscroft nor Adams acknowledge this insight or carry it over into their account of empathy. To return to a third-person perspective, however, what I am suggesting is that the observer in Ravenscroft's example would appraise the climber's situation in a similar fashion to the climber himself.

In a related fashion, Vittorio Gallese and Alvin Goldman (1998) propose that recent research on *mirror neurons* lends support to the simulation theory. Say that you perform a goal-directed action such as attempting to grasp an object (read: overhang on cliff-face) with your hand: it is plausible that this action is mediated by circuits in the motor regions of your brain. The next step, however, is more counterintuitive. When you watch a target person performing the same goal-directed action - i.e., attempting to grasp an object (overhang) with *their* hand - the aforementioned circuits 'light up' once again, thereby 'mirroring' that person's action. In one key sentence in the article, Gallese and Goldman make the crucial link between mirror neurons and simulation: 'Our conjecture is only that [mirror neurons] represent a primitive version, or possibly a precursor in phylogeny, of a simulation heuristic that might underlie mind-reading.' The link in question, however, may be even more tentative than the authors suggest. Although postulating the role of mirror neurons seems reasonable when the main 'starting point' for a simulation is a target person's action, we may have to look elsewhere when the main 'starting point' is the *situation* in which that person finds themselves. Contrary to the claim that the same type of neural substrate underlies both the performance and observation of the climber's actions, the 'substrates' underlying the climber's situation (the drop) on the one hand, and their psychology on the other, are fundamentally different; in this case, then, the closest approximation to mirror neurons may be the corresponding 'appraisal pattern'.

* * *

According to the proposed account, an appraisal process fails to distinguish the observer (the 'self') from the climber (the 'other') in some particular sense. Why, though, would an appraisal process exhibiting 'self-other fusion' occur in the first place? And how does the altruistic behaviour which potentially results from such a process square with the egoistic overtones of Darwin's theory of evolution by natural selection? In order to address these questions, let us consider the case from an evolutionary perspective, addressing the adaptationist and byproduct hypotheses in turn (see Figure 5.6).

Figure 5.6: An evolutionary perspective: adaptation or byproduct?



N.B. FM is an abbreviation for filtering mechanism. The upward arrows indicate *activation* via the perceptual systems (not represented), whereas the downward arrows indicate *inhibition* from central systems (exhibiting global sensitivity).

(1) The adaptationist hypothesis. Our consideration of the adaptationist hypothesis can be broken down into two key questions. First, what are the potential advantages of automatic appraisal with respect to the *appraiser*? If the appraiser is in close proximity to the target person, then the target person's situation may be of direct relevance to the appraiser's own goals and concerns; viz., if our environments are one and the same, then an event of emotional significance taking place in *your* environment also takes place in *mine*. Considering that emotions are thought to perform a functional (i.e., adaptive) role - the emotion of fear having 'object-', 'goal-', and 'action-orientation' - a degree of 'emotional contagion' is likely to be adaptive. Second, what are the potential advantages of automatic appraisal with respect to the *target person*? The appraiser's emotional responses may facilitate their awareness and understanding of the target person's situation, which, in turn, may increase the probability of their offering that person (suitable) assistance. More significantly, the appraiser's emotional responses may facilitate the shift from *egoism* to *altruism*: if the appraiser is capable of experiencing some of the target person's fear, then it is plausible that they will be motivated to assist that person in order to ease their own suffering.

Tooby and Cosmides (1996) note that evolutionary theorists have proposed two principal 'pathways' to altruism: namely, *reciprocal altruism* and *kin selection*. The basic principle underlying reciprocal altruism - introduced by Williams (1966) and developed by Trivers (1971) - is best expressed by the old saying, 'You scratch my back and I'll scratch yours.' It is obviously advantageous for us to enter into reciprocal exchanges of this kind, and a series of mechanisms may have evolved to ensure that the probablity of *non*-reciprocation is minimised: a possible example of such a mechanism is the Cheater Detection module discussed previously. Although such exchanges may lead to feelings of guilt and shame, they are primarily social, as opposed to emotional, in nature.

In contrast, the phenomenon of kin selection involves apparently selfless and potentially emotional relationships between members of the same kin, the most obvious example being parental care. All other things being equal, we are more likely to help offspring and close relatives than we are complete strangers. Given, however, that empathy and altruism often extend to *non*-kin, we need to widen the scope of our enquiry. According to Dawkins (1989, p.94), kin selection is a 'special consequence' of a more general process: namely, *gene selection*. This claim brings us to Dawkin's central thesis: 'the fundamental unit of selection, and therefore of self-interest, is not the species, nor the group, nor even, strictly, the individual. It is the gene, the unit of heredity.' (p.11) Following Dawkins's notion of the 'selfish gene', Davies (1996, p.25) suggests that the existence of empathy / altruism at the level of the individual loses its sense of paradox when we consider the view that the 'self' and the 'other' are of equal importance as genetic 'survival machines'.

In light of these two arguments, have we evolved a separate set of appraisal mechanisms for appraising other people's situations, a potential candidate being the case of the struggling climber? Nichols (2001, p.449) proposes that there is a *Concern Mechanism* which, significantly, may be both functionally and neurobiologically distinct from the mechanism underlying the simulative activity of perspective-taking; he argues that studies on young children and autistic children - who are capable of concern but not adept at adopting another person's perspective - suggest that there is a 'double dissociation' between the mechanisms in question. Alternatively, have we evolved some sort of *filter mechanism* which deliberately filters information regarding, say, the climber's situation to the original set of appraisal mechanisms outlined above - an instance of evolutionary co-optation?

(2) The byproduct hypothesis. In order to address the byproduct hypothesis, let us consider a factor which relates to the first half of Smith's (1995) structure of alignment: namely, the factor of *perceptual access* (as opposed to *subjective access*). In the real world,

we only tend to have (close) perceptual access to our own 'emotional situations'. Consider our passing relationships with relatives, friends, and acquaintances. Sometimes we catch a glimpse of other people's lives, sometimes other people's lives overlap with our own; for the most part, however, our view of the world is inevitably egocentric. Perhaps, then, this constitutes a 'default setting' of the mind/brain - let us call it *default mode 1*.

How does this relate to the case of the struggling climber? Both Ravenscroft and Adams fail to recognise two key points. First, although the climber is 'in danger' whereas the observer is '*not* in danger', the distinction between the climber's perspective and the observer's perspective is not a question of all-or-nothing. The two perspectives overlap in a perceptual sense at the very least; for instance, the climber may see their arms straining to hold onto the overhang from a distance of a few centimetres, whilst the observer may see this action from a distance of many tens of metres.[11] Considering this perceptual overlap, it is plausible that the observer would 'draw on' the personal and environmental variables in the automatic manner described by Lazarus and Frijda. Of course, the observer's primary appraisals would be counter-balanced by secondary appraisals which would effectively say something along the lines of "Fortunately, it's not you up there!" In light of this, the end-result would be a deeply harrowing, though ultimately vicarious, emotional experience.

How does the byproduct hypothesis apply to a *filmic version* of the case of the struggling climber? In a non-fiction (documentary) film such as *Touching the Void*, the perceptual perspectives of the climber and observer overlap to an even greater extent; indeed, the two perspectives may occasionally fuse into one. Notice, however, that our primary concern here is not the historical nature of the film's subject-matter but the artificial nature of the film's reconstructions. In this respect, similar remarks can be made about fiction film. In Hitchcock's hands, for example, not only would we see the climber's arms straining to hold onto the overhang from close up; we would also receive the vertiginous view from the top of the cliff, possibly by means of the zoom-dolly shot cited previously. First, we would not need to imagine that we were positioned within the climber's world, for our perceptual system would operate *as if* this were the case by default. Second, the more affective primary appraisal afforded by the greater perceptual 'overlap' would be counterbalanced by a secondary appraisal which would not only effectively say 'Fortunately, it's not you up there!', but also, 'That climber is only a

[11] Cf. Humphrey (1922): 'the visual experience of cutting one's finger is essentially the same as that of seeing another person cutting his or her finger.' Cited by Zillmann (1991), p.143.

fictional character, played by a trained stunt man wearing an invisible harness', and so on. In conclusion, as viewers of a cinematic, as opposed to a real (immediate), situation, our emotional response to the climber's plight would be harrowing, even if it did not reach the intensity of Ravenscroft's own experience.

(3) Conclusion. So which is the best solution: the adaptationist hypothesis or the byproduct hypothesis? If appraisal is necessary for producing empathetic responses in certain circumstances, then one could argue that it *does* distinguish the 'self' from the 'other', but, given the relative safety of the appraiser and the adaptive value of empathy, cognitive processing resources are devoted to appraising the target person's situation. With respect to fiction film, however, this move takes us back to the paradox of fiction: viz., why would a Concern Mechanism 'care' about the situation of a (non-existent) fictional character, or why would a filtering mechanism deliberately filter information regarding such a situation to our appraisal system? Following Ockham's razor, moreover, the adaptationist hypothesis posits either four or five mechanisms; the byproduct hypothesis is the most economical in the sense that it only posits a total of three mechanisms. Considering these questions, perhaps it is better to attribute the apparent 'self-other fusion' to a lack of discriminatory power, a deficit which, incidentally, has adaptive value. (After all, the embarrassment that 'false positives' may cause is of no consequence to the 'selfish gene'.)

(ii) The case of the anxious stranger
(default mode 2: spatio-temporal attachment)

In the case of the struggling climber, the cause of the climber's emotional state - namely, the drop - is immediately available to our senses. To what extent, though, is this case typical? In order to answer this question, let us consider the second half of Smith's (1995) structure of alignment: namely, the factor of *spatio-temporal attachment*. In the real world, we only tend to have (sustained) spatio-temporal attachment to our own 'emotional narratives'. Perhaps, then, this constitutes another 'default setting' of the mind/brain - let us call it *default mode 2*.

Imagine, for instance, sitting opposite an anxious stranger on a train journey (see Frame 5.4). Suppose, for the sake of argument, that the stranger is alone, so the option of eavesdropping onto an illuminating conversation is unavailable to us. Considering that the cause of the stranger's emotional state lies in the past or the future, or the ongoing, but 'absent', present, it is plausible that we would not have access to a sufficient amount of contextual and biographical information to perform an emotional-related appraisal of their situation.

Frame 5.4: The case of the anxious stranger: BBC news story on stress

Given that the stranger's appearance is all that we have to go by, association and simulation would seem to be our only options. To begin with, we could focus on the stranger's face and body: by doing so, we might 'catch' some of their anxiety via the mechanisms of affective and motor mimicry on the one hand, and facial and bodily feedback on the other. Alternatively, we could 'imaginatively project' ourselves into the stranger's place: the stranger is carrying a briefcase - are they anxious because they have an important deadline to meet at work? The latter point, however, raises two issues. First, it is not clear how such an imaginative exercise would actually begin. Following an exchange with Daniel Dennett, Robert Gordon (1995b, p.101) suggests that such exercises do not occur naturally, stating 'if people did this routinely, we wouldn't have to *say* to them, "Put yourself in her place".' (In a related fashion, postulating the role of mirror neurons - as simulative 'precursors' - is untenable when the main 'starting point' for the simulation is resolutely behind closed doors.) Second, it is not clear how this imaginative exercise would bridge the gap between theory and experience: remember that the act of empathising with another person is not merely to understand their emotions; rather, it is to actually feel them (or something approaching them).

Suppose, though, that the case of the anxious stranger was included as a scene in a (classical) fiction film exhibiting causal coherence and featuring goal-directed characters. (When Richard Hannay catches the train to flee to Scotland in Hitchcock's *The 39 Steps*, for instance, he glances nervously at his travelling companions who are reading a potentially incriminating newspaper.) In the filmic version, the term 'stranger' might no longer be appropriate: following Gordon's observation, even if the film did not put us in the character's place in a literal sense, it would 'routinely' provide us with sufficient information *about* that place; we might be allowed a look at the emotional narrative of the stranger *prior* to the scene in the train (and possibly *during* it, via, for example, POV shots and flashbacks). Does this fact favour appraisal or simulation? Considering the default mode in question, this information might play a role in activating corresponding 'goal structures', a fact which would facilitate the role of appraisal processes. Of course, this argument does not constitute a definite challenge with respect to the simulation account for the availability of information might facilitate exercises of the imagination as well; it does suggest, however, that simulation, as commonly defined, might be largely superfluous.

In conclusion, we have identified two default modes of the mind/brain which are of potential significance in film viewing (see Table 5.6). Smith suggests that the phenomenon of 'recognition' is so fundamental to our engagement with characters that it goes completely unnoticed by lay viewers and academics alike; the notion of a 'default mode' is proposed in the same revelatory spirit. Film, especially in its televisual form, is such an accepted part of our everyday lives that we fail to realise just how extraordinary it really is. Contrary to our intuitions, the fact of the matter is that even if we were exposed to film for twenty-four hours a day, seven days a week, our experience of being given detailed and sustained access to other people's lives - their perceptions, actions, situations, and narratives - would remain the exception rather than the rule - in a phylogenetic sense if not an ontogenetic one. And it is phylogeny, rather than ontogeny, that establishes the fundamental properties of our perceptual, cognitive, and emotional systems.

Table 5.6: Default modes of the mind/brain

structure of alignment	default mode	principal method of over-ride
(1) perceptual / subjective access	(1a) "My sensory perceptions." (see perceptual analysis)	central processing (representation versus referent)
	(1b) "My emotional situation." (see primary appraisal)	central processing (= secondary appraisal)
(2) spatio-temporal attachment	(2a) "My behavioural actions." (see perceptual analysis)	central processing (representation versus referent)
	(2b) "My emotional narrative." (see primary appraisal)	central processing (= secondary appraisal)

(b) Two cases from the cinema

Having considered two cases of real world empathy, let us turn to cases of cinematic empathy (and sympathy). And given that theorists tend to agree on the role of association, let us concentrate on appraisal as some sort of an 'alternative' to simulation. When considering situations presented by fiction film, it is often difficult, if not impossible to disentangle the effects of appraisal from those of association on the one hand, and simulation on the other - largely due to a high level of 'emotional redundancy'. For this reason, amongst others, the following discussion will be based on two further examples of pure cinema from the films of Alfred Hitchcock.

(i) The case of the protective son
(empathy, central imagining)

The storyline of Hitchcock's *Psycho* (1960) is well-known. Marion Crane (played by Janet Leigh) works in a real estate office in Phoenix, Arizona. In the opening scene, Marion meets her lover Sam Loomis (John Gavin) in a hotel room during her lunch break; through expositional dialogue, we learn that the two are forced to conduct their relationship in secret and that they cannot marry until Sam pays off his father's debts and his ex-wife's alimony. When Marion returns to work later that afternoon, her employer entrusts her to deposit $40,000 at the bank. With visions of a new future, Marion decides to abscond with the money and join Sam at his hardware store in Fairvale, California.

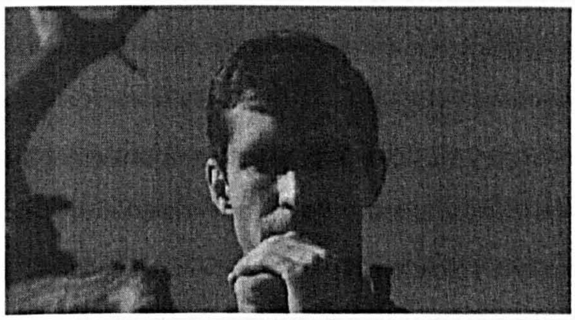
After driving for many hours - darkness drawing in and rain lashing against the windscreen - she pulls off the highway and checks into a motel. The proprietor, of course, is Norman Bates (played by Anthony Perkins), a nervous young man who lives with his old and domineering mother. The scene of interest is not, however, the notorious shower scene discussed in Chapter 4 - in which Marion is unexpectedly murdered by an unknown assailant (apparently Norman's mother) - but a relatively low-key scene which follows soon after. Grodal (1997, pp.94-95) briefly discusses the scene in question in order to illustrate his theory of cognitive identification, empathy, and motivation; the following account, though established independently of Grodal and for a number of different reasons, will develop certain aspects of his theory.

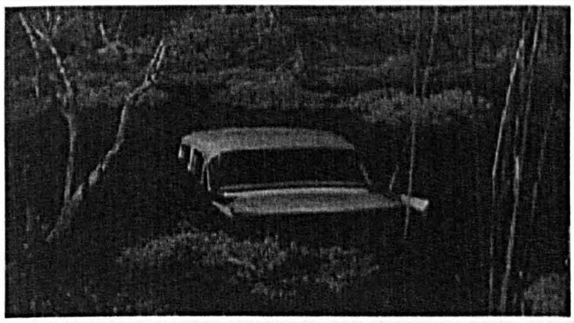
After Marion is murdered, Norman discovers her body lying on the bathroom floor. In a celebrated series of interviews with Hitchcock, the French New Wave director François Truffaut (1986) makes the following observation:

> One intriguing aspect is the way the picture makes the viewer constantly switch loyalties. At the beginning he hopes that [Marion] won't be caught. The murder is very shocking, but as soon as [Norman] wipes away the traces of the killing, we begin to side with him, to hope that he won't be found out. (p.417)

After 'wiping away the traces of the killing' and placing Marion's body into the boot of her car, Norman drives to a nearby swamp. In the first shot of the given scene, Norman pushes the car into the water. From this point onwards, we are presented with a series of shot/reverse shot couplets: beginning with a shot of Norman chewing gum whilst nervously clasping his hands in front of his mouth (shot 2), followed by a POV shot of the car slowly sinking (shot 3), and so forth.

Frames 5.5 and 5.6: The case of the protective son: *Psycho* (1960)





In shot 9, the car stops sinking; a fact which is corroborated by the sudden absence of bubbling noises on the sound track. Norman stops chewing (shot 10), and after the camera confirms that the car is stationary (11), he looks quickly around to see if anyone is nearby (12). Considering that Hitchcock provides us with approximately the *same* narrational information as Norman - at least with respect to his attempt to cover up a crime - the scene conforms to Hitchcock's criterion for producing *surprise* (see Gottlieb, 1995). This point is exemplified by the particular relationship between the shots: Hitchcock gives us optical access to the event in question by means of the POV structure.

Following Truffaut's previous remark, Hitchcock describes our subsequent emotional response as follows:

> Earlier, we talked about the fact that when a burglar goes into a room, all the time he's going through the drawers, the public is generally anxious for him. When [Norman] is looking at the car sinking in the pond, even though he's burying a body, when the car stops sinking for a moment, the public is thinking, 'I hope it goes all the way down!' It's a natural instinct. (pp.420-421)

In shot 13, the car begins to go 'all the way down' - this movement is corroborated by the sound track - and in the subsequent reaction shot (14), Bates begins to smile. In shot 15, the car finally disappears; Bates smiles fully (16) and the scene fades out on the image of the still swamp (17). Given our previous anxiety, it is reasonable to assume that the disappearance of the car is accompanied by a feeling of relief.

Given that our 'loyalties' have been resolutely with Marion for the first quarter of the film and Norman's attempt to dispose of her body is an example of a criminal act, why do we feel anxious when the car stops sinking and why do we experience a sense of relief when the car 'goes all the way down' - possible examples of what Smith (1999) describes as *perverse allegiance*? And how should we understand the 'natural instinct' which Hitchcock describes?

Assuming that we are sitting comfortably in our cinema seat, our feeling of anxiety conforms to Hoffman's (1987, p.48) definition of *empathy*; namely, 'an affective response more appropriate to someone else's situation than to one's own.' More specifically, our capacity to feel anxiety *with* the character of Norman seems to be a good candidate for *central imagining*. To paraphrase Currie, the scene in question seems to leave something to our imagination; Hitchcock does not tell us how we should feel when the car stops sinking. In light of this, one could argue that to 'empathetically reenact' Norman's situation, we must simulate his belief that he is attempting to dispose of a person's body along with his desire to cover up a crime, and we must 'feed' these simulated mental states into our emotional appraisal system, and so forth.

In order to trace the cognitive appraisal route to empathy, our first task will be to 'rule out' the influence of the associative network route as far as possible (see Table 5.7). One way of doing this is to control the independent variables, as it were, by attempting to remove *emotion cues* from the empathy equation. This is where the scene's status an example of 'pure cinema' comes into play. To begin with, the scene is devoid of dialogue and potentially emotive elements of film style. In particular, it is a testament to Hitchcock's intuitive understanding of human psychology - and his skill as a film-maker - that he realised that Bernard Herrmann's famous musical score was *not* required in order to heighten the tension in this particular scene. (Interestingly, in the 1998 remake of *Psycho*, Gus Vant Sant chooses to add an adaptation of Herrmann's musical score written by Danny Elfman. In this respect, Van Sant *does* tell us how we should be feeling.)

With respect to *personal cues*, Norman 'displays' facial and bodily expressions of anxiety. One could argue, however, that our empathetic response is not dependent on these facial and bodily expressions. First, they are not sufficiently accentuated to elicit a strong emotional response in the viewer either directly as emotional stimuli or indirectly via affective mimicry and facial feedback. Second, there is a five second delay between the sound of the car ceasing to sink in shot 9 and Norman's overt behaviour in shot 12; this delay provides adequate time for an emotion-related appraisal process to go through a sufficient number of 'cycles'. If anything, then, Norman's behaviour in shots 10 and 12 serves merely to confirm that the car has, in fact, stopped sinking, and that this event is, indeed, of emotional significance. With respect to *situational cues*, perhaps the sight of a half-submerged car - with its possible associations with the themes of crashing and drowning - could be classified as an emotional stimulus in its own right. One could argue, however, that this is stretching Damasio's notion of a 'range of stimuli' too far. What would have happened, for instance, if we had *not* known that Marion's body was in the boot of the car?

Table 5.6: Controlling the independent variables

	associative network route		cognitive appraisal route
	personal cues?	situational cues?	situational meaning?
standard case	yes	yes	yes
Hitchcockian case	no	no	yes

Examples of the standard case include the case of the inferno cited by Zillmann (1991) and the case of the struggling climber cited by Ravenscroft (1998).

(ii) The case of the compulsive thief
(sympathy, acentral imagining)

The distinction between empathy and sympathy - and suspense and surprise - can be demonstrated by bringing Hitchcock's story about the burglar into play. To recap, Hitchcock refers to this story whilst discussing the scene from *Psycho* with Truffaut (1986). The story itself, from earlier in the interview, goes as follows:

> A curious person goes into somebody else's room and begins to search through the drawers. Now, you show the person who lives in that room coming up the stairs. Then you go back to the person who is searching, and the public feels like warning him, 'Be careful, watch out. Someone's coming up the stairs.' Therefore, even if the snooper is not a likeable character, the audience will still feel anxiety for him. (p.90)

In actual fact, Hitchcock filmed a version of this scenario in his later work *Marnie* (1964). The eponymous heroine of the film (played by Tippi Hedren) is a kleptomaniac who uses her good looks to gain employment at one company, before absconding with a substantial sum of money, changing her identity, and starting the whole process again in a different location. In the introductory scenes, Marnie starts working at a Philadelphian publishing company run by Mark Rutland (Sean Connery). In the scene of interest, Marnie attempts to steal some money from the company safe after the office has closed for the day; the potential 'discoverer' is a cleaning woman (played by Edith Evanson) who is walking along an adjacent corridor whilst mopping the floor. Instead of employing parallel editing to show us one person followed by the other, Hitchcock utilises a single frame (see Frame 5.7). Considering that Hitchcock provides us with *more* narrational information than Marnie - at least with respect to her attempt to get away with a crime - the scene conforms to Hitchcock's criterion for producing *suspense*. This point is exemplified by the particular arrangement of the elements within the frame: Hitchcock denies Marnie optical access to the event in question by means of a wall between the room containing the company safe and the adjacent corridor.

Frame 5.7: The case of the compulsive thief: *Marnie* (1964)

In the following shot, Marnie walks out of the room containing the safe and suddenly freezes: a first POV shot confirms that the cleaner is within her sights. Marnie looks around for a possible escape route and a second POV shot reveals a staircase in front of her. In order to make a silent exit, she takes off her shoes and puts them in her coat pocket. As Marnie creeps passed the cleaner, the camera switches to the 'third person' once again, three close shots revealing that one of her shoes is slipping out. When the shoe finally crashes to the ground, she turns round in alarm, but a third and final POV shot shows that the cleaner continues to mop the floor with her back turned. Ceasing the opportunity, Marnie creeps down the staircase before a man enters and walks over to the cleaner. In a subsequent conversation between the two, we learn that the cleaner is practically deaf - the punchline, as it were, of a joke by Hitchcock.

Following Hitchcock's remark, why is it plausible that we feel like warning Marnie, "Be careful, watch out. Someone's coming along the corridor." - another possible example of perverse allegiance? Considering that we are aware of the cleaner's approach whereas Marnie is oblivious to it, our affective response conforms to the definition of sympathy (see Table 5.7). More specifically, our capacity to feel anxiety *for* the character of Marnie seems to be a good candidate for what Currie (1995) describes as *primary imagining* (acentral imagining). In order to spell out this imaginative exercise in terms of simulated beliefs and desires, however, Currie (ibid., p.148) would be obliged to claim that we imaginatively project ourselves into the place of an invisible witness of a real-world counterpart of Marnie's situation (see Currie, 1997, and Turvey, 2004).[12]

Placing considerations of simulation to one side, how should we rule out the influence of the associative route to sympathy? Once again, Hitchcock's love of 'pure cinema' allows us (effectively) to control the independent variables by removing emotion cues from the empathy equation. To begin with, the scene is practically devoid of diegetic, as well as non-diegetic, sound: the closing of the safe door is only audible if one listens very carefully. With respect to personal cues, the fact that the scene is filmed in long shot means that it does not present close-ups of facial or bodily expressions of emotion. Similarly, with respect to situational cues, there is nothing intrinsic to either the sight of the cleaning woman approaching (frame left), or the sight of Marnie opening the safe (frame right) which is of emotional significance; it is only when these elements are considered *together* that such significance potentially emerges.

[12] In order to solve the 'paradox of caring', Currie (1997) argues that the reader of a fictional account simulates the mental states of a *hypothetical* reader of a *factual* account, who, in turn, is (unproblematically) simulating the mental states of *real* people in *real* situations. This argument was discussed by Turvey (2004) at the fourth CCSMI conference.

Table 5.7: Empathy versus sympathy

	state of viewer's narrational knowledge	associated emotion
case of empathy (central)	equal to character's (symmetry)	surprise
case of sympathy (acentral)	more than character's (asymmetry)	suspense

(c) Three arguments against simulation theory

Having ruled out the influence of the associative network route to empathy, our second task is to introduce the cognitive appraisal route as a possible 'alternative' to the simulative route outlined above. In order to undertake this task, let us address four arguments from the theory theory (TT) versus simulation theory (ST) debate. In this section, I will consider three of the main arguments *against* simulation theory - and thereby *for* theory theory - as outlined by Martin Davies and Tony Stone (1995) in their twin anthologies on folk psychology and mental simulation (see key point 3).[13]

(i) How does simulation (appraisal) begin?

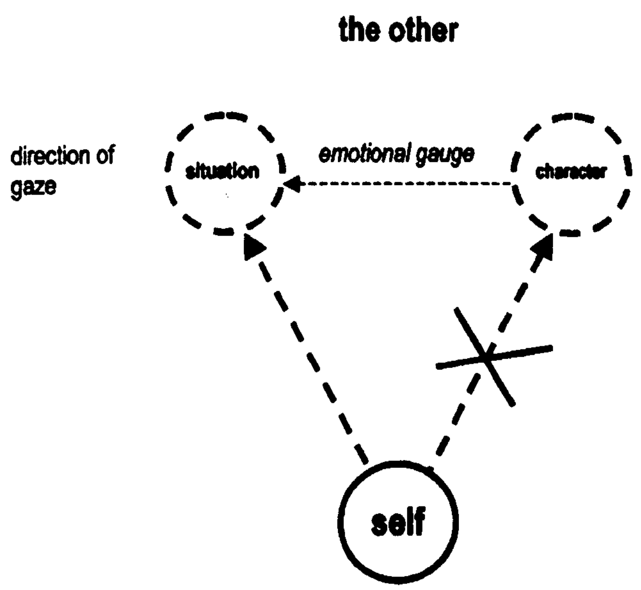
How should we understand our capacity to feel empathy for Norman and sympathy for Marnie? Even if this capacity involve simulation, the theory theorist might argue that simulating another person's emotions depends on us having some sort of *folk psychological theory* about what those emotions are. This point brings us to the first argument from the TT versus ST debate: namely, *how does simulation (appraisal) begin?*

This argument is tackled by simulation theorists Jane Heal (1995a) and Robert Gordon (1995a). First, Heal proposes what can be described as the *direction-of-gaze argument* (pp.48-49). According to this argument, the theory theorist misinterprets the

[13] Questions (i) to (iii) are based on the three arguments outlined by Davies and Stone (1995, section 3.1, pp.18-24). These arguments are ordered and entitled as follows: (1) 'Theory-driven or process-driven simulation'; (2) 'Getting started'; and (3) 'Cognitive penetrability'. Some of these arguments have been addressed by Currie and Ravenscroft (2002).

'direction' of the simulator's 'gaze': the simulator 'is not looking at the subject to be understood but at the world around that subject'. From our perspective, Heal's claim that 'It is what the world makes the replicator think which is the basis for the beliefs he attributes to the subject.' can be translated as follows: 'It is how the replicator *appraises* the world which is the basis for the *emotions* he attributes to the subject.' Second, Gordon makes a distinction between two types of imaginative projection (pp.102-105). *Total projection* is the method we use when we are *already* in the target person's shoes; by virtue of this fact, it can be classified as 'the *default mode* of simulation'. *Partial (or 'patched') projection*, on the other hand, is the method we use when our shoes occupy a slightly different place to those of the target person; it may involve the 'recentring' of our 'egocentric map'.

Figure 5.7: Model of situational / character engagement (I)



N.B. In the case of sympathy, we are directing our gaze at the target person's situation, but the character does not serve as an emotional gauge for measuring the appropriateness of our appraisals / simulations.

How should we understand these two arguments with respect to the scene from *Psycho*: first, are we directing our gaze at the character of Norman or his situation?; and second, which type of imaginative projection is most appropriate? Starting with the first question, Grodal's (1997) theory of *cognitive identification* suggests that we are directing our gaze at Norman himself. With respect to the scene from *Psycho*, Grodal proposes that:

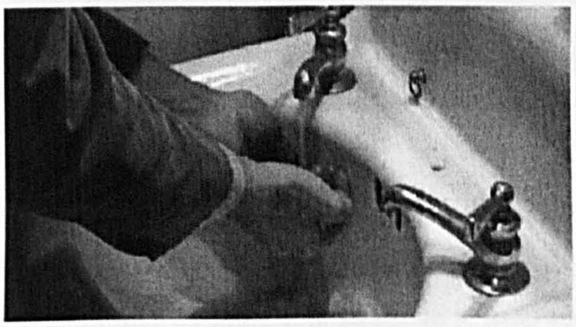
'The viewer has cognitively identified himself with [Norman] over a longer period of time, and has, during this period, been 'forced' to 'actualize' the emotions which are presupposed in order to give coherence and meaning to his acts.' (pp.94-95) It is unclear, however, how such identification actually comes about.

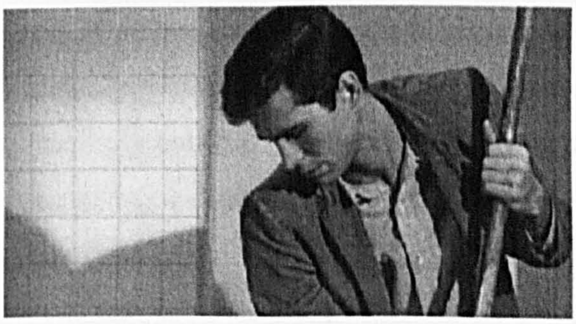
This brings us to the second question. According to Smith's (1995) model of *character engagement*, total projection is sufficient for we are *already* in Norman's place in terms of the *structure of alignment*. To begin with the function of *spatio-temporal attachment*, Hitchcock allows us to witness Norman's attempts to 'wipe away the traces of the killing' in a sequence which *precedes* the scene in question: for instance, we see Norman laying the shower curtain on the bedroom floor as a shroud for Marion's body, before washing the blood off his hands in the bathroom sink, removing the blood from the bath, walls, and floor with a mop, and drying the tiled surfaces with a towel. Although the camera often keep its distance - framing Norman in tableaux - it occasionally moves in for a better view of the action: notable examples include close shots of Norman washing his hands and Norman mopping the bath (see Frames 5.8 and 5.9). To move on to the function of *subjective access* - and the role it plays in the scene itself - Hitchcock presents us with a series of shots from Norman's optical perspective; namely, the shots of the car slowly sinking described previously. Smith argues against the popular conception that the POV shot is the 'essence' of subjective access; that is, access to a character's *psychology* (pp.156-165). His argument can be supported, perhaps, by pointing out that if the POV shot gives us (direct) access to anything in this particular scene, then it is to Norman's *situation*. (In this respect, perhaps the term 'subjective access' should be replaced with the more neutral term 'perceptual access'.)

Significantly, a combination of Heal and Gordon's simulation account with Smith's model of character engagement suggests a *reversal* of the type of explanation which might be offered by Smith (and Grodal) with respect to the scene from *Psycho*. The direction-of-gaze argument implies that we do not primarily engage (identify) with the character of Norman; rather, we primarily engage (identify) with Norman's *situation*. Despite the shift from character engagement to *situational engagement*, however, Smith's structure of alignment serves to clarify that Norman's situation does not end with the environment which immediately surrounds him - the swamp in front or the night-time sky behind - but includes his narrative up to and including the moment when the car stops sinking. In summary, our capacity to empathise with Norman does not begin with us employing a folk psychological theory about what people usually think and feel when they find themselves in the type of situation in question (pro theory theory). Nor does it begin with us making adjustments in our imagination by 'recentring' our 'egocentric map' (pro simulation theory). Hitchcock, as manipulator of the filmic world, effectively performs these psychological operations on our behalf. In the Ptolemaic universe of the cinema, then, we remain stationary whilst the filmic world revolves around us.

Considering the shift of emphasis, what role does the character of Norman actually play? To recap, Carroll (1990) argues that we *assimilate* the situation as a whole, including both the object of the character's emotions and the character themselves. How should we understand the notion of 'assimilation'? Ed Tan (1995, pp.14-15) suggests that '[t]he film viewer tries to construct situational meaning as perceived by the character, cued by the latter's expressive behaviour and by what is known about the situational context'. In light of this suggestion, it is plausible that Norman functions as a kind of *emotional gauge* for measuring the appropriateness of our simulations (appraisals) in the manner described in section 4.4: for instance, if he had burst into fits of hysterical laughter when the car stopped sinking, then we would have had cause to reappraise the situational meaning in question. (Norman may also serve as a *target* for our causal attributions - this point will be developed below.)

Frames 5.8 and 5.9: The 'cleaning sequence'





How should we understand the direction-of-gaze argument with respect to the scene from *Marnie*: are we directing our gaze at the *character* of Marnie or her *situation*? And which type of imaginative projection, if any, is most appropriate? To tackle the functions of spatio-temporal attachment and perceptual / subjective access in tandem, Hitchcock allows us to witness Marnie waiting for her colleagues to leave the building in a sequence preceding the scene in question: for instance, Marnie says goodbye to her colleagues and walks into the restroom. In one notable shot, Marnie stands in a cubicle listening to the sound of people's voices gradually die away (see Frame 5.10). As soon as there is silence, Marnie exits the cubicle and the camera follows her from the restroom door into the office, and from the office into the room containing the safe; this tracking shot is intercut with three POV shots, the final one featuring the safe combination.

Frame 5.10: The 'waiting sequence'

With regard to a simulation account, postulating that we 'imaginatively project' ourselves into the place of Marnie, on the one hand, or an invisible witness on the other, would fail to produce a satisfactory explanation. In the first instance, the act of 'recentring' our 'egocentric map' would effectively cut us off from the relevant 'channel' of information (namely, "a cleaning woman is approaching"), whereas in the second instance, we would be obliged to 'multiply entities' beyond plausibility as well as necessity. As we will see, the appraisal account has a distinct advantage in this respect: because it does not appeal to the notion of 'imaginative projection', it is capable of explaining our (potentially) sympathetic response in terms of the 'hot', and indiscriminate, processing of *two* 'channels' of information; namely, the information provided by both the left and right-hand sides of the frame.

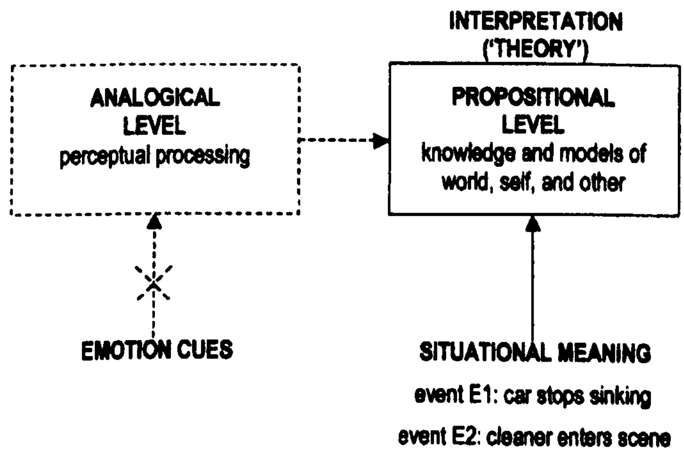
(ii) Is simulation (appraisal) theory-driven?

Even if a folk psychological theory is not required to *start* our simulation (appraisal) of either Norman or Marnie's situation, the theorist theorist could still argue that such a theory is required to *guide* our simulation (appraisal) once it has begun. This point brings us to the second argument from the TT versus ST debate: namely, *is simulation (appraisal) theory-driven?* In reply, simulation theorists acknowledge that a computer-generated simulation of a given phenomenon (say, a weather system) must be guided by a theory of how that phenomenon behaves. They argue, however, that a *human's* simulation of *another human's* mental states need not be guided by a theory of any kind. If the subject's 'input states' sufficiently resemble those of the target, and the subject's decision-making system operates in a similar way to that of the target, then an adequate simulation can be guided by the *process* of (normal) decision-making; in other words, simulation is *process-driven.*

Contrary to both sides of the debate, the distinction between theory- and process-driven capacities may turn out to be a superficial one. To illustrate this point, it is important to clarify what we mean by the term 'theory'. Some theory theorists draw literal comparisons with the theories proposed by scientists: for instance, Alison Gopnik and Henry Wellman (1995) propose that a folk psychological theory relies on theoretical constructs and law-like relations. Significantly, however, Stich and Nichols (1995, pp.132-135) describe two less ambitious conceptions of theory. According to the *narrow conception,* all 'cognitive capacities' are dependent on 'internally represented knowledge structures' which are 'sentence-based and rule-based'. According to the *broad conception,* on the other hand, at least some cognitive capacities can be modelled by connectionist (neural) networks. The decision-making system cited by simulation theorists must rely on theory in at least one of the senses described.

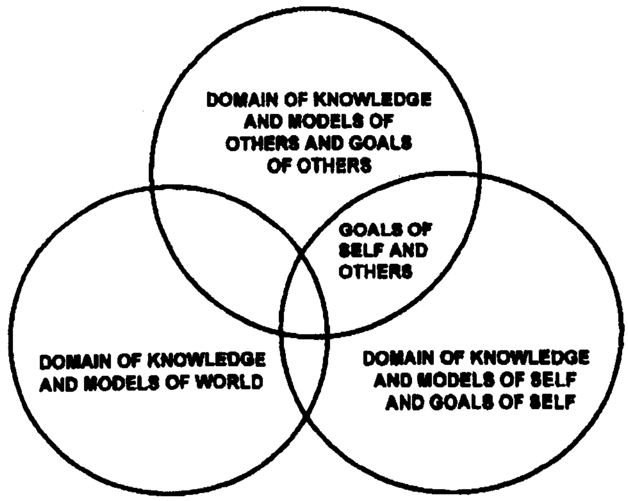
Of course, our simulation (appraisal) of Norman and Marnie's situation involves empathy and sympathy as opposed to behaviour prediction; therefore, the decision-making system should be replaced with an *emotional appraisal system.* In light of this fact, do the above arguments still apply? And how do we go about appraising the meaning of the respective situations? These questions bring us back to the SPAARS approach originally advanced by Power and Dalgleish (1997) and outlined in the previous chapter (see Figure 5.8). Given that the proposition that 'an appraisal process is process-driven' is trivially true, our main task is to ascertain whether or not such a process is 'theory-driven' in any meaningful sense. Considering that the car ceasing to sink and the cleaning woman entering the scene are both examples of situational meaning, the first significant port of call in the mind would be the *propositional level* where knowledge relating to the given situation would be activated. This process would result in an *interpretation* of the meaning of the respective situations: for example, 'There is a danger that Marion's body may be discovered' or 'There is a danger that the cleaning woman may discover Marnie.'

Figure 5.8: The SPAARS framework: the role of theory



The key question is to what extent do interpretations at the propositional level make reference to theory in the senses described? To begin with, we need not commit ourselves to the Gopnik and Wellman-type claim that the knowledge in question constitutes some sort of rigorous scientific theory. According to Power and Dalgleish, however, it is plausible that the propositional level contains *models of the world, self, and other* (see Figure 5.9). With respect to the scenes from *Psycho* and *Marnie*, possible examples include models of the criminal justice system on the one hand, and models of what is to attempt to either cover up or commit a crime on the other. It seems reasonable to suggest that these models must be in place in order for 'the self' to respond emotionally to equivalent situations which are of personal relevance. More significantly, it seems reasonable to suggest that when these models are centred on 'the other', they constitute some sort of folk psychological theory about how the target person's beliefs and desires relate to their perceptions and behaviours. Given, furthermore, that these models entail 'internally represented knowledge structures' which are 'sentence-based and rule-based', they are equivalent to theory in the narrow sense defined by Stich and Nichols.[14]

Figure 5.9: Understanding the propositional level: domains of mind content



Based on Figure 5.3 from Power and Dalgleish (1997), p.158.

(iii) Is simulation (appraisal) cognitively penetrable?

The issue of theory- versus process-driven simulation (appraisal) is closely related to the third and final argument from the TT versus ST debate: namely, *is simulation (appraisal) cognitively penetrable?* According to Stich and Nichols (1995, pp.150-152), if our mind-reading capacity is dependent on theory, then it should be cognitively penetrable with respect to, say, gaps in our knowledge. If, on the other hand, our mind-reading capacity is dependent on simulation, then it should be cognitively *im*penetrable in the sense described. Stich and Nichols offer the following example to illustrate this point. If subjects are asked to select the most superior item from a collection of consumer products which are all, in actual fact, identical, which one will they choose? If we use simulation to answer this

[14] Currie and Ravenscroft (2002, Ch. 3) also address the relationship between simulation and theory. They define the activity of theorizing as passing 'from one or more propositions to some other proposition via mental processes that are apt to track relations of logical or evidential dependence' (p.60). According to this definition, our propositional interpretations of Norman's situation can be legitimately regarded as examples of theorizing. Currie and Ravenscroft conclude that '[s]imulation is theorizing if and only if what it is a simulation of is theorizing' (p.63). According to this view, it is possible that our interpretations can be regarded as simulations of Norman's mental states.

question, then we should expect our prediction to be unaffected by our ignorance of the so-called 'position effect'. The fact of the matter, however, is that we are unlikely to correctly predict that subjects tend to choose the item on their right; this failure suggests that our prediction is dependent on the employment of a folk psychological theory which does not contain the relevant information. In reply, simulation theorists argue that an adequate simulation of the scenario in question would require the manipulation of sensory (and other) inputs which are not provided by a spoken or written description.

Once again, the appraisal account may provide us with a way of reconciling the two sides of the debate. Imagine being in the place of a real-world counterpart of Norman or a witness of a real-world counterpart of Marnie's situation. Although your emotional appraisal of the event of the car failing to go 'all the way down' or the event of the cleaning woman entering the scene would occur automatically, it would be cognitively penetrable in the sense that it would make reference to your relatively accessible beliefs and knowledge about the world. This point can be illustrated by way of a simple thought experiment. Suppose that, for some strange reason, you acquired the false belief that half-submerged cars were such a commonplace occurrence in Californian swampland that they never provoked investigation by the police or that every cleaner employed in a Philadelphian publishing company was hard of hearing. If you witnessed the events in question whilst holding such beliefs, then your appraisal of their emotional significance would still occur in a mandatory fashion but the appraisal would be less likely to result in the feeling of anxiety. To return to our role as film viewers, the crucial point with regard to simulation is as follows. Considering that we do not conjure up emotional states out of thin air, one could argue that an adequate 'simulation' of the emotions of either Norman or the real-world witness of Marnie's situation would be cognitively penetrable in the way described.[15]

[15] Currie and Ravenscroft (2002, Ch. 5) tackle the 'cognitive penetrability' argument by appealing to the condition of *cognitive conservation*: this condition stipulates that when you simulate a subject *S*'s reasoning or decision-making, 'you should appeal to *just the same* theories or beliefs or information that *S* appeals to in his reasoning or decision-making' (p.92).

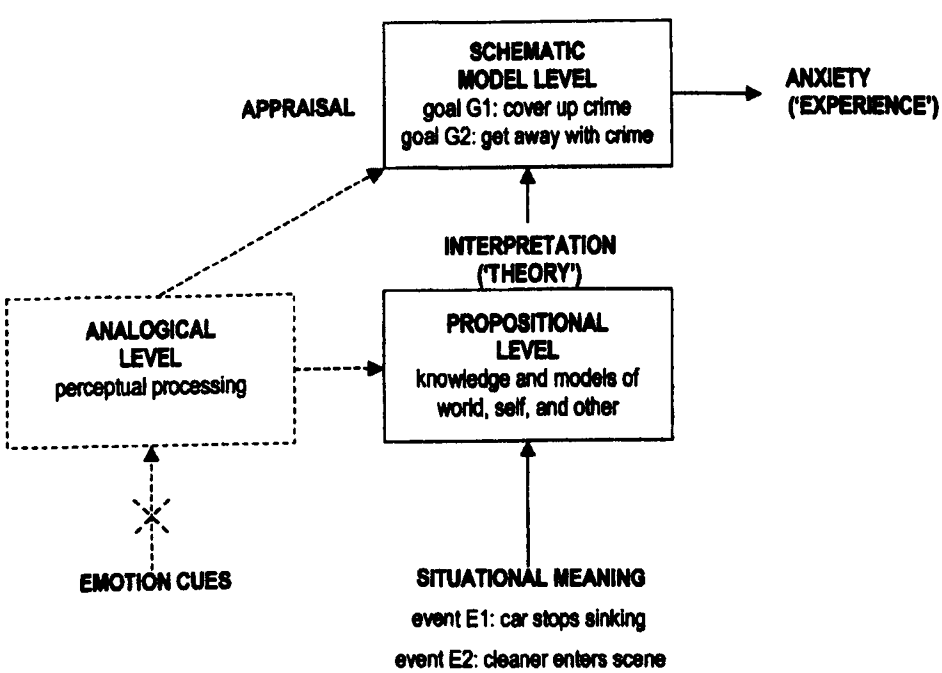
(d) One argument against theory theory

Our consideration of three of the main arguments *against* simulation theory (and thereby *for* theory theory) suggests that the appraisal account is dependent on theory in certain respects. If this is the case, however, then we must address one of the main arguments *against* theory theory, and thereby *for* simulation theory (see key point 4).

(i) How does folk psychology (appraisal) bridge the gap between theory and experience?

In order to bridge the problematic gap between theory and experience, we must return to the SPAARS framework once again (see Figure 5.10). With respect to the propositional level of the mind, the interpretations of situational meaning - for example, 'There is a danger that Marion's body may be discovered' and 'There is a danger that the cleaning woman may discover Marnie.' - would be 'cold' and non-emotional in nature. At the *schematic model level*, however, these interpretations would be related to appropriate 'goal structures' to produce an *appraisal* (proper) of the respective situations; this appraisal would result in the generation of a 'hot', emotional response (namely, anxiety) with its physiological, behavioural, and subjective components.

Figure 5.10: The SPAARS framework: bridging the gap between theory and experience



The next important issue to consider is how these goal structures come to be activated in the first place. Starting with *Psycho*, the cleaning sequence described previously lasts for over eight minutes. One can speculate as to why Hitchcock devotes nearly one-tenth of the film's running time (excluding the credits) to a sequence which does not clearly advance the film in terms of either spectacle or narrative: Greg M. Smith (2003, p.80), for instance, describes Norman's cleaning efforts as 'an extraordinarily mundane sequence of action'.[16] There are two possible explanations. The first explanation has a degree of historical specificity: it is plausible that Hitchcock wanted to allow the unsuspecting viewer of 1960 to recover, at least partially, from the emotional shock of the shower scene, before introducing new twists and turns in the narrative. The second explanation, however, is more relevant to the project in hand: following Truffaut's remark, it is plausible that Hitchcock wanted to give the viewer, from both then and now, a sufficient opportunity to 'switch' their 'loyalties' from Marion to Norman.

How should we understand this switching of loyalties? Grodal (1997, p.95) explains the switching in terms of cognitive identification, proposing that we identify with Norman because there is no other character for us to identify with: he notes that after Marion is murdered, 'a vacuum is created which the young man [Norman] partially fills'. Smith (1995) would spell out these identificatory relationships in the more precise terms of character engagement.

The appraisal account suggests a different explanation, however. According to the notion of *default modes 1* and *2* introduced previously, in the real world we only tend to have (close) perceptual access to our own emotional situations and (sustained) spatio-temporal attachment to our own emotional narratives. In light of this, when we focus exclusively on, say, a (goal-directed) action for a reasonable period of time, it tends to be an action that *we*, ourselves, are performing. Although the cleaning sequence may be mundane in terms of content, the fact that we are exposed to that content is truly extraordinary: the close shots of Norman washing his hands and mopping the bath provide us with an optical approximation of the views we would have if we were washing our own hands or mopping the bath ourselves (see Frames 5.8 and 5.9). First, it is plausible that certain levels of the mind/brain do not make a distinction between the proposition,

[16] The only apparently significant 'unit' of narrative information concerns Norman's discovery of a folded newspaper which, unbeknownst to him, contains the stolen $40,000. This turns out to be something of a red herring, however, for the psychologist's monologue at the film's conclusion reveals that Norman disposes of the money along with Marion's body.

"*Norman* is wiping away the traces of the killing," and the proposition, "*I* am wiping away the traces of the killing." Second, in the way that some psychologists propose that 'emotional contagion' occurs when we are allowed to witness another person's facial expressions, perhaps something like *goal contagion* occurs when we are allowed to witness another person's actions: this process of contagion results in the *activation* of the goal structures which correspond to Norman's situation (as a person attempting to cover up a crime), and the *de-activation* of the goal structures which correspond to Marion's situation (as a person on the run from a crime).

A similar, and possibly stronger, argument can be made with respect to the scene from *Marnie.* The film aligns us with Marnie from the very outset; the scene occurs a third of the way into a two hour plus film. Significantly, the waiting sequence described previously lasts for nearly three minutes. Of particular interest is the shot of Marnie standing in a cubicle; Hitchcock chooses to stay with this shot for the best part of a minute (see Frame 5.10). Once again, one can speculate as to why Hitchcock devotes such a section of the film's running time to a sequence (and shot) which does not clearly advance the film in terms of either spectacle or narrative. It is plausible, however, that the duration of the sequence (and shot), in conjunction with the fact that Marnie's intentions to steal money from the company safe are clearly signalled earlier in the film, is sufficient to activate goal structures which correspond to Marnie's situation, as opposed to, say, the situation of the cleaning woman. As a result, we do not have to make a conscious decision to root for Marnie when the cleaning woman enters the scene.[17]

Given that the appropriate goal structures have been activated by default, how do we go about cognitively appraising the events themselves? Although cognitive appraisal is potentially susceptible to the frame problem, it can be partly thought of in terms of Stich and Nichols's broad conception of 'theory': the fact that at least some cognitive capacities can be modelled by connectionist networks brings us to back to the notion of 'parallel constraint satisfaction' (see Figure 5.11).

According to Thagard and Verbeurgt (1997), a goal G and an event E can be regarded as nodes in a connectionist network. If the achievement of goal G is facilitated by

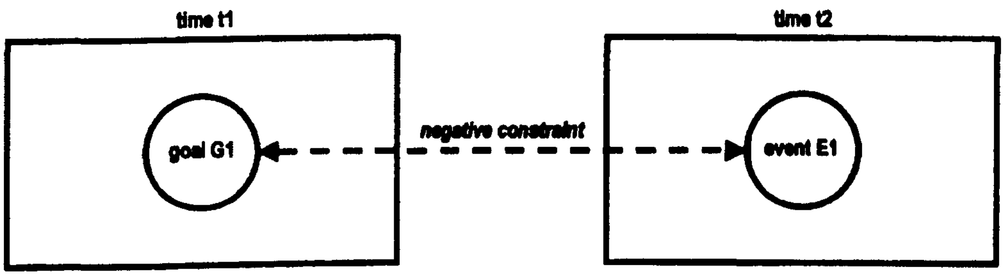
[17] Following Ortony, Clore, and Collins (1988, Ch. 3), analogues of Norman's and Marnie's active-pursuit goals may be constructed 'as and when needed'. It seems reasonable to propose that we are capable of constructing A-goals when embarking on a new task - say, a game of chess. Alternatively, the constructive process could be achieved by modifying *existing* A-goals: at some stage of our lives, no doubt, we have tried to either cover up or get away with some sort of misdemeanour, however minor. In addition, the goals in question may be subordinate to interest goals which are already in place, an example being the preservation of one's personal liberty.

event E, then there is a *positive constraint* between the nodes in question; this positive constraint is equivalent to an excitatory link. Alternatively, if the achievement of goal G is hindered by event E, then there is a *negative constraint* between the two nodes; this negative constraint is equivalent to an inhibitory link. In the scene from *Psycho*, the goal structure (G1) of attempting to cover up a crime - brought into play at time t1 (the cleaning sequence) - is negatively constrained by the event (E1) of the car failing to go 'all the way down' which occurs at time t2. (Alternatively, we can think of the goal-directed action (G1) initiated by Norman in the forward shot as being negatively constrained by the event (E1) depicted in the reverse shot.) In the case of *Marnie*, the particular arrangement of the elements within the frame almost enables us to visualise the process of parallel constraint satisfaction in action; the event (E2) of the cleaner entering the scene on the left-hand side of the frame negatively constrains the goal-directed action (G2) performed by Marnie on the right.

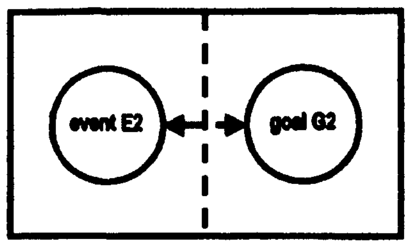
Significantly, Thagard and Verbeurgt (ibid., p.3) state: 'A negative constraint between two elements can be satisfied only by accepting one element and rejecting the other.' In the cases in question, where we effectively wish to maintain the goal but cannot conceivably ignore the event, the negative constraints in question cannot be satisfied. In a related paper, Barnes and Thagard (1997, p.8) claim: 'Emotions are very important to this sort of process, since we have no conscious access to the mental operation of parallel constraint satisfaction, and feelings such as happiness, relief, fear, and anxiety provide consciousness with a reading of the overall state of constraint satisfaction.' In light of this, it is plausible that the failure of the corresponding neural network to achieve parallel constraint satisfaction is signalled by the feeling of anxiety already discussed. Similarly, the 'rejection' of the corresponding event - upon the car finally going 'all the way down' and the cleaning woman failing to discover Marnie as she creeps away - is accompanied by a feeling of relief.

Figure 5.11: Understanding the schematic model level: parallel constraint satisfaction

(1) The case of the protective son: *Psycho*



(2) The case of the compulsive thief: *Marnie*



(e) Literalizing the metaphor: the three key stages

Having introduced the cognitive appraisal route to empathy as a possible 'alternative' to the simulative route, our third and final task is to show how the appraisal account may actually improve upon its simulative counterpart. With respect to the type of model outlined in Figures 5.1 and 5.2, Currie and Ravenscroft (1997, pp.177-178) suggest that the notions of 'feeding in pretend versions of beliefs and desires' and 'running the decision-making apparatus off-line' have a largely metaphorical status. In contrast, we can conceive of the appraisal account as an attempt to go beyond the level of metaphor in certain ways: each of the three key stages of the simulation account - namely, inputs, processing, and outputs - can be spelt out in more literal terms.

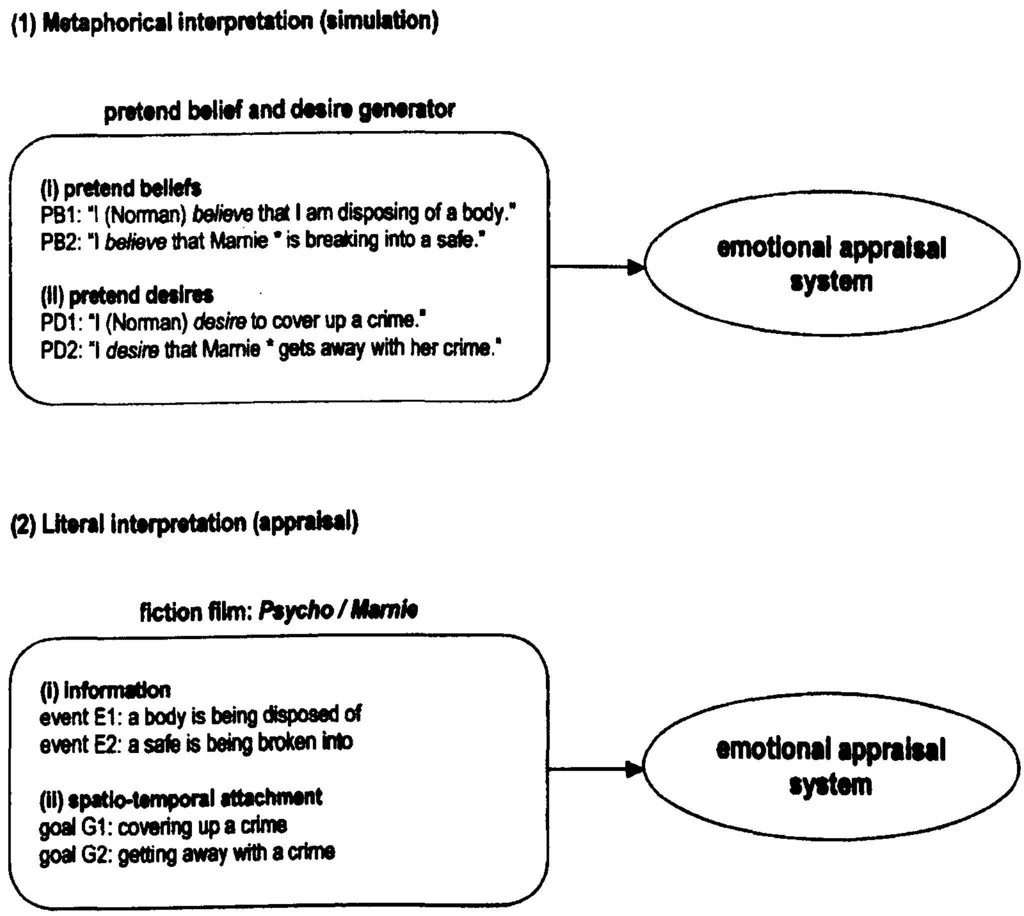
(i) Inputs

Starting with the scene from *Psycho*, our capacity to feel anxiety *with* the character of Norman seems to be a good candidate for central imagining. To paraphrase Currie, the scene in question seems to leave something to our imagination; unlike Van Sant, Hitchcock does not tell us how we should feel when the car stops sinking. In light of this, one could argue that to empathetically reenact Norman's situation, our 'pretend belief and desire generator' must generate the 'pretend belief' that we are attempting to dispose of a person's body along with the 'pretend desire' to cover up a crime. (Note that a propositional attitude consists of two key elements: namely, a proposition and an attitude towards that proposition.) Subsequently, we must 'feed' these pretend beliefs and pretend desires into our emotional appraisal system, and so forth.

The appraisal account provides us with a potential way of 'literalizing' these particular metaphors (see Figure 5.12). Generating the pretend belief that one is attempting to dispose of a person's body may be equivalent to processing *information* which stipulates that a body is being disposed of. Here, the propositional content of the belief is provided by the given information, whilst the attitudinal element is implicit in the *processing* of this information. Similarly, generating the pretend desire to, say, cover up a crime may be equivalent to processing the information in question with respect to certain *goal structures* which, through the function of spatio-temporal attachment, are already activated by the time the car stops sinking. Here, the propositional content of the desire is provided by the corresponding goal structure, whilst the attitudinal element is implicit in the activation of this goal structure.

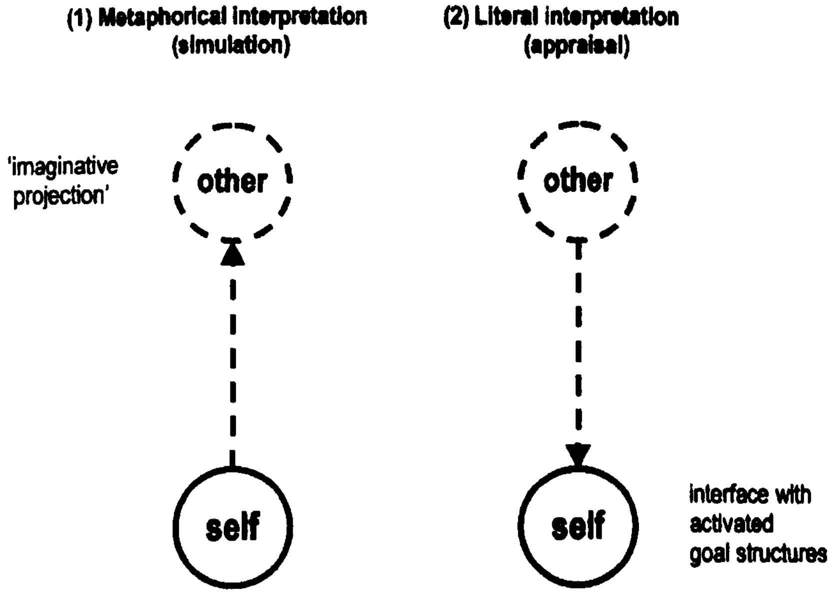
With respect to the scene from *Marnie*, our capacity to feel anxiety *for* the character of Marnie seems to be a good candidate for acentral imagining. Following Currie, once again, one could argue that we are required to imaginatively entertain that the events depicted by the scene are actually taking place, including the simulation of appropriate beliefs and desires. According to the appraisal account, however, generating the pretend belief that Marnie is attempting to break into the company safe is equivalent to processing information which stipulates that a safe is being broken into. Similarly, generating the pretend desire that Marnie manages to get away with her crime is equivalent to processing this information with respect to certain goal structures which, through the function of spatio-temporal attachment, are already activated by the time the cleaner enters the scene.

Figure 5.12: Literalizing the metaphor (I)



In a related fashion, the simulation theorist might propose that we are required to 'imaginatively project' ourselves into the place of Norman (central imagining) on the one hand, or the place of an invisible witness of a real-world counterpart of Marnie's situation (acentral imagining) on the other. Once again, the appraisal account provides us with a potential way of 'literalizing' these particular metaphors (see Figure 5.13). In short, we are not required to project ourselves into the place of either a character or an invisible witness; rather, the film presents us with information and we (automatically) process this information. Period. In conclusion, the appraisal account replaces the more metaphorical terms of 'simulation' with the more literal terms of *'hot', as opposed to 'cold', information processing*. Although this account still leaves us with a potentially intractable problem from a computational perspective, it does not burden we, the viewer, with an unreasonable work load: the task of simulating the extraordinary is effectively undertaken by the film itself, whilst the task of appraising the extraordinary is automatically undertaken by psychological mechanisms which are already in place.

Figure 5.13: Literalizing the metaphor (II)



N.B. Although the direction of the arrow illustrating 'imaginative projection' is in the same direction as the arrow which illustrates our 'gaze' (see Figure 5.7), the two arrows refer to fundamentally different phenomena: the former refers to a process of the imagination, whereas the latter refers to a process of attention.

(ii) Processing

How should we understand the processing stage? In opposition to theory theory, many simulation theorists appeal to the factors of *parsimony* and *simplicity*: for instance, the simulation account is parsimonious in the sense that, in Goldman's words, it gets '*both* its 'data base' *and* its control mechanism for free', and simple in the sense that it apparently dispenses with a (complicated) psychological theory. To what extent does the appraisal theorist appeal to the factors in question? To begin with, the appraisal account is parsimonious in the sense that it appeals to appraisal processes (or 'patterns') which are 'freely' available, so to speak; in this respect, it is very much in the same spirit. The question of whether or not the appraisal account is simple, on the other hand, is more problematic.

In order to illustrate this point, let us briefly return to the simulation account. Contrary to first appearances, it is plausible that the notion of 'simplicity' in play merely amounts to the following: by drawing a line around the so-called 'decision-making system' in the case of behaviour prediction - and the so-called 'emotional appraisal system' in the case of empathy - the simulation theorist is not obliged to describe the internal operations of either system. Given, however, that both decision-making and emotional appraisal may appeal to theory in the ways cited above, the simulation theorist actually exchanges the complex problem of formulating the principles employed by a psychological theory with the equally complex problem of formulating the principles employed by the mechanisms in question. To my knowledge, this point has not been given the attention it deserves.[18] In conclusion, both the simulation and appraisal accounts of empathy may appeal to exactly the same phenomena, however simple or complex; the only difference lies in the scope of their particular enquiries, in what they choose to investigate and what they choose to ignore.

(iii) Outputs

According to the simulation account of behaviour prediction described by Stich and Nichols, the decision-making system operates in an *offline* fashion: its outputs are diverted away from the 'action control system' and sent to the 'behaviour predicting and explaining system' instead. In contrast, the simulation account of empathy described by Nichols et al. (1996, p.60) proposes that the 'emotional response system' operates in an *online* fashion: although it is 'input deviant', it elicits 'genuine emotional responses'. Following the argument in the third chapter, the appraisal account can take this proposal one step further. The physiological and subjective components of our emotions can be described as 'online': hence, the possible feeling of anxiety - which apparently originates in the pit of our stomach - when the car stops sinking and the cleaning woman enters the scene. (It is plausible that these components could be measured by GSR tests and verbal reports respectively.) The behavioural component, on the other hand, should be described as 'offline': ultimately, we do not offer the characters assistance, or shout out warnings, even though we may feel the inclination to do so.

[18] Fodor has argued that the decision-making system exploits some sort of internally represented theory: see Stich and Nichols (1995), note 7, p.154. This point is also cited by Currie and Ravenscroft (2002), p.91.

(f) Literalizing the metaphor: final considerations

The attempt to literalize the metaphor does not end with the three key stages, however. Once our emotions have been brought into play by the film, how should we understand the subsequent processes of 'transferring' our emotions to the character and 'monitoring' our emotions for appropriateness? And how should we understand the relationships between empathy and sympathy on the one hand, and between egoism and altruism on the other?

(i) Attribution

In the model outlined thus far, the emphasis has been on *situational engagement* as opposed to Smith's notion of *character engagement*: following simulation theory, it has been proposed that we direct our gaze at the character's situation as opposed to their psychology, thereby finding ourselves in a congruent emotional state. Both the proponents and critics of such a theory might argue, however, that our happening to be in the same emotional state as the character is not sufficient for either simulation or empathy: somehow, we must *transfer* our emotional states to the character (see Fuller, 1995, and Heal, 1995b). (In a related fashion, Nöel Carroll (personal communication) points out that for the model in question to be classified as a model of empathy in particular - as opposed to a model of the emotions in general - it must propose that we are in a certain emotional state *because* the character is in that state.)

How should we understand the transferral process in question? From the perspective of behaviour prediction, Gordon (1995c, pp.54-57) states that the argument for such a process is based, in turn, on an argument from analogy which requires that: (1) we introspect our mental states; and (2) we have theoretical knowledge about which of those mental states are likely to be 'shared' by the target person. His objections to the first point concern the difficulties of introspecting propositional attitudes, and so forth; his main objection seems to be to the second point, which 'threatens to collapse the simulation theory into a form of theory theory'. In short, Gordon argues that the theorists who assume that a transferral process is necessary do not account for the difference between simulating *oneself* in the target person's situation and simulating the *target person* in that situation: if we 'transform' ourselves into the target person by 'recentring our egocentric map', then a subsequent transferral process - 'from me to you' - is simply not required. (As we have seen, the film-maker effectively performs the psychological operation of 'recentring' on our behalf.)[19]

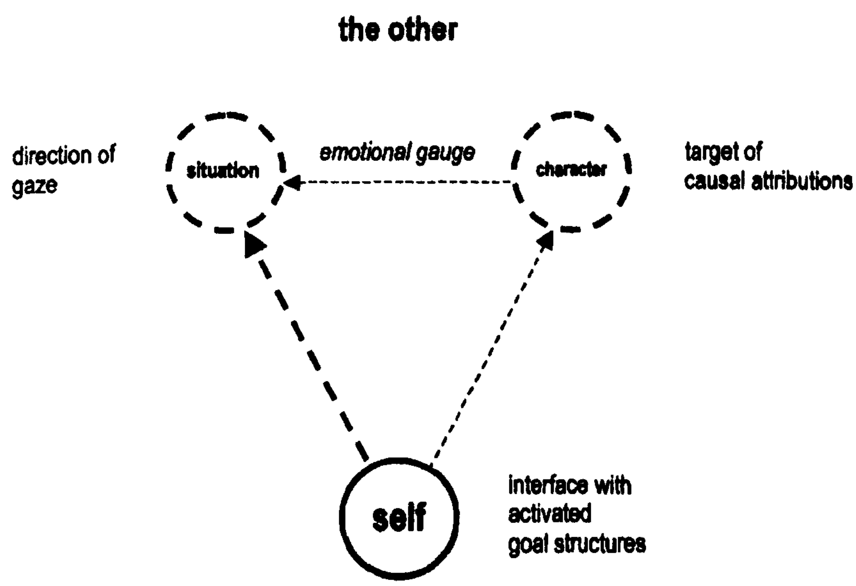
Despite these arguments, understanding the potential shift from the type of situational engagement described previously to the type of character engagement originally described by Smith, requires us to take the notion of a transferral process seriously - hopefully, a reconsideration of this process will provide us with at least a partial answer to Carroll's objection (see Figure 5.14). First, it is plausible that we have some sort of access to our own emotional responses; this access can be accounted for in terms of somatic feedback, and so forth. Notice, then, that in this particular instance, introspection need not be problematic. Second, according to attribution theory, we tend to causally attribute our emotional responses to the most salient objects in our environment. From an anthropomorphic perspective, it is plausible that these objects are often fellow human beings, whilst from a perceptual perspective, it is plausible that these objects are often well-lit and mobile: when presented with repeated close-ups of a character whilst sitting in a dark (and static) theatre, it stands to reason that the character stands out from both their environment and our own.

This brings us to the following conclusion with respect to the case of empathy. Even though, as 'appraisers', we are directing our gaze at Norman's *situation* rather than at his psychology, as 'attributors', we (mis)attribute our feeling of anxiety to Norman's *psychology* rather than to either his situation as a character or our situation as a viewer. It should be acknowledged that some kind of theory may come into play here. This theory can be spelt out, however, in terms of a relatively simple 'rule-of-thumb' which can be expressed as an if-then conditional: for instance, 'If person X is placed in situation Y, then they are likely to experience emotion Z.' The end-result is that we *label* our feeling of anxiety as 'feeling *with*' his character. In the case of sympathy, the transferral process is slightly different. As 'appraisers', it is plausible that we are directing our gaze at Marnie's situation. With respect to our role as 'attributors', however, the converse claim cannot be made: considering that we are aware of the cleaning woman's approach whereas Marnie is oblivious to it, it is implausible that we attribute our feeling of anxiety to Marnie's psychology. At this point, another theoretical 'rule-of-thumb' may come into play, expressible, once again, as an if-then conditional: for example, 'If person X cannot see

[19] Gordon's argument is challenged by Currie and Ravenscroft (2002, section 3.2). They argue that an inference 'from me to you' is necessary if the simulation in question is to contribute to *my* beliefs and knowledge regarding the nature of *your* mental states.

person Y, then they are unlikely to experience emotion Z.' Given, however, that Marnie has a high level of salience as both a human being and the film's heroine, it is likely that we label our feeling of anxiety as 'feeling *for*' her character.

Figure 5.14: Model of situational / character engagement (II)



N.B. This diagram should be considered in conjunction with Figure 5.7. (It also incorporates one of the findings of Figure 5.13: namely, the interface with activated goal structures.) In the case of sympathy, we are directing our gaze at the character's situation; although the character may serve as a target for the causal attributions of our emotional responses, they do not serve as an emotional gauge for measuring the appropriateness of our appraisals / simulations.

In order to fully understand the nature of attribution and labelling, it is important to ascertain to what extent the words 'empathy' and 'sympathy' refer to natural kinds (see Table 5.8). In the light of various arguments cited above, the general root *pathos* (meaning 'feeling') may refer to states of the brain and body common to both empathy and sympathy. From an *information-processing perspective*, for instance, the two cannot be distinguished in terms of basic characteristics of the appraisal process: both the scenes from *Psycho* and *Marnie* present an event which is incompatible with an activated goal structure. Period. Similarly, from a *psychophysiological perspective*, the two cannot be distinguished in terms of physiological and phenomenological components. First, many emotion theorists believe that there are only distinct physiological 'patterns' for each of the five basic emotions: namely, fear, disgust, anger, sadness, and happiness. Second, articulating the nature of our emotional experience is notoriously difficult: all that we can reasonably say is that our experience is 'affectively congruent' - in terms of hedonic valence - with what we commonly understand by the terms in question.

Given the inconclusiveness of both the information-processing and psychophysiological perspectives, the qualifying prefixes *em-* (meaning 'with') and *sym-* (meaning 'for') may be ultimately dependent on the properties of the filmic world - especially, the method of alignment employed by the film-maker and the state of our narrational knowledge as viewers. If, for instance, we are provided with approximately the *same* narrational information as the character of Norman - at least with respect to his attempt to cover up a crime - then perhaps our emotions should be classified as 'empathetic'. Alternatively, if are we provided with, say, *more* narrational information than the character of Marnie - at least with respect to her attempt to get away with a crime - then perhaps our emotions should be classified as 'sympathetic'. As we have seen, these points are exemplified by either the particular relationship between shots or the particular arrangement of the elements within the frame: if the forward and reverse shots from *Psycho* are 'optically connected', then the long shot from *Marnie* is 'optically divided' so to speak. In conclusion, the key difference between empathy and sympathy is *external*, as opposed to *internal*, to the brain and body; the 'centring' or 'acentring' in question is a function of the filmic world itself. Intriguingly, this move may lead us to a partially *externalist*, as opposed to *internalist*, view of the mind: in McCulloch's (1995, esp. pp.184-224) words, the view that the mind is 'constituted by the objects which are its phenomena'.

Table 5.8: The relationship between empathy and sympathy: internalism versus externalism

	internal factors (brain, body)		external factors (filmic world)
	physiology	**phenomenology**	**state of narrational knowledge?**
general root: ***pathos*** **('feeling')**	negative ANS patterns	negative affect	
qualifying prefix: ***em-*** **('with')**	as above	as above	equal to character's
qualifying prefix: ***sym-*** **('for')**	as above	as above	more than character's

(ii) Monitoring

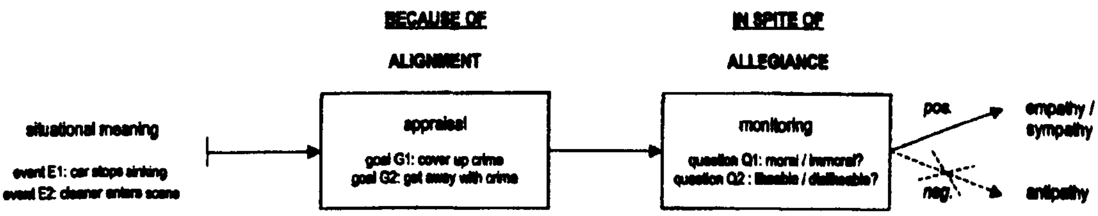
The appraisal account outlined above has focused on one half of Smith's (1995) model of character engagement: namely, the 'structure of alignment' in terms of the factors of perceptual / subjective access and spatio-temporal attachment. How, though, should we understand the other half of Smith's model: namely, the issue of *allegiance* (see Figure 5.15)? In order to answer this question, let us return to the third stage in Zillmann's three-factor theory of empathy. To recap, Zillmann proposes that our emotional responses to a target person (and their situation) undergo 'monitoring' for appropriateness. If the target person is conceived of as being *moral* and/or *likeable* in nature, then the affective response may be labelled as an instance of empathy or sympathy. If, on the other hand, the target is conceived of as being immoral and/or dislikeable, then the affective response may be *(dispositionally) overridden* and re-labelled as, say, an instance of *antipathy* - usually defined as 'having opposite feelings'.

Smith proposes that allegiance is based on moral evaluation: we feel an allegiance to a character because we morally approve of their actions, and so forth. Considering, however, that both Norman's and Marnie's actions - covering up a crime on the one hand, and committing a crime on the other - are morally dubious, our empathetic and sympathetic responses present us with possible examples of *perverse* allegiance; indeed, as Hitchcock implies, this is partly what makes our responses so intriguing. In a subsequent article, Smith (1999, pp.222-223) argues that the issue of perverse allegiance is not a problem for his model, stating that the key question to be considered is as follows: 'do we feel an allegiance with - a sympathy for - a character *because of* the perverse act that they engage in or *in spite of* that act?' According to this argument, our empathetic and sympathetic responses are not genuine examples of perverse allegiance, on the grounds that they are elicited 'because of' the structure of alignment, the process of automatic appraisal, and so forth; *not* the possible immorality of the actions in question. How, though, should we understand the 'in spite of' clause? Given that we are led to believe that Norman is attempting to protect his mother (as opposed to perverting the course of justice), whilst Marnie's behaviour is largely compulsive (and aimed at a faceless corporation), it is unlikely that our empathetic and sympathetic responses will be dispositionally overridden and re-labelled.

The issue of allegiance need not end with moral evaluation, however. In a review of Smith's model cited previously, Gaut (1997) argues that 'clearly I can identify with characters because of many qualities besides moral ones: they may be physically attractive, witty, interesting, wild or whatever.' This argument - acknowledged by Smith (ibid.) - can be supported by two additional points. First, in reference to Marion's murder, Grodal argues that 'a vacuum is created which [Norman] partially fills'. Although the camera occasionally lets him out of its sights during the eight minute plus sequence in which he cleans the bathroom, it neither departs thematically from his attempt to cover up the crime nor focuses on another character. As a human agent, then, Norman not only acts as a *target* for our empathetic response; he also acts as an *exclusive* target.

Second, according to the *familiarity hypothesis*, the more familiar a person is, the more we tend to like them. Conversely, Hatfield et al. (1994, p.148) propose that we are more susceptible to emotional contagion if we regard our relationship to the target person as 'one of relatedness and/or likeness rather than independence and uniqueness' - such a relationship is based in part on familiarity (paraphrased by Plantinga, 1999, p.250). Considering that the scene from *Marnie* occurs a third of the way into a two hour plus film, we have more than sufficient time to become acquainted with Marnie's character, at least in terms of her physical appearance. As a human agent, then, Marnie not only acts as a *target* for our sympathetic response; she acts as a *familiar* (and potentially *likeable*) target. Given that the factors of exclusivity and familiarity facilitate the transferral and development of our empathetic and sympathetic responses, it is unlikely (once again) that they will be dispositionally overridden and re-labelled.

Figure 5.15: Monitoring



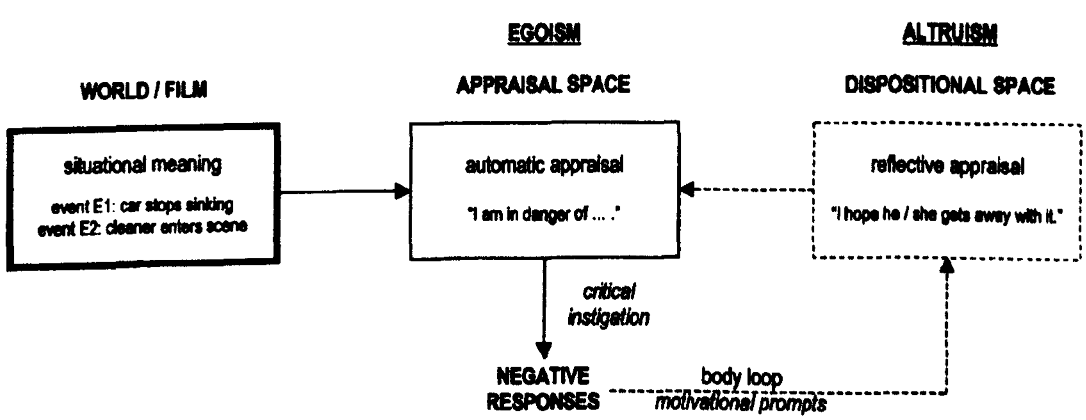
(iii) Reflection

Following Hoffman's multi-dimensional theory of empathy, Davis (1996) proposes that our capacity to empathise with a target person - and sympathise with their situation - facilitates the shift from *egoism* to *altruism*: if we are capable of experiencing some of a target person's negative emotions, then it is plausible that we will be motivated to help that person in order to ease our own suffering. This line of reasoning can be developed as follows. If the body is the 'theatre for the emotions', then egoism and altruism are inevitably interwined: *I* (the ego in the equation) can only feel *your* emotions in *my* body; therefore, the (altruistic) act of helping *you* will (inevitably) serve to help *me*. What is more, this argument not only expresses a contingent fact about the way we happen to be constructed as human beings; it also seems to have a certain *necessary* (that is, logical) force. Contrary to first appearances, then, the argument may actually provide us with a way of challenging the negative connotations of the term 'egoism': viz., we should not think of egoism as an unfortunate fact about human nature; rather, we should think of it as a contingent (and necessary) consequent of the way the world happens to be (and the way the world must be).

Following Damasio's notion of the image space, we can think of appraisal patterns as being realised in an *appraisal space* (see Figure 5.16). Starting with the role of *egoism*, the appraisal process can be brought into play in a nonconscious and unintentional fashion by the external world of the film. As we have seen, automatic appraisal does not make a distinction between the self and the characters: when the car stops sinking and the cleaner enters the scene we experience a negative emotion akin to anxiety. Given that a negative emotion is unpleasant - almost by definition - it stands to reason that we will seek to *reduce* it in some way. The key question is how does this reduction take place? Considering the transferral process described above, our feelings of anxiety are centred firmly on the characters of Norman and Marnie, albeit through some sort of attribution error. (Considering the subsequent monitoring process, moreover, these feelings will not ruled out by dispositional override.) Given that these characters are virtual and fictional beings, however, the option of our offering them any sort of assistance is obviously not available to us.

Moving onto the role of *altruism*, the same appraisal space - and the same appraisal patterns - may be brought into play consciously and intentionally by the internal world of the mind/brain, thereby leading us to the intentional level of explanation. Following Damasio's discussion, we can think of appraisal patterns as being stored in a *dispositional space*. Significantly, our negative responses may serve as *motivational prompts* of a particular kind (operating via the body loop). The most plausible, and apparently natural, way of reducing our negative responses is to keep our eyes rooted on the screen and devote our conscious (attentive) processing resources to *reflectively appraising* the pros and cons of the depicted situation, whilst hoping that everything turns out for the best. If we wish to reduce the negative arousal which results automatically from constrain 'dissatisfaction' when the car stops sinking (an instance of egoism), then we may consciously assess the likelihood of the car remaining half-submerged and so forth, whilst hoping that the car 'goes all the way down' on Norman's behalf (an instance of altruism). Similarly, if we wish to reduce the negative arousal which is brought into play automatically when the cleaning woman enters the scene (egoism), we may consciously assess the likelihood of the woman catching sight of Marnie, whilst feeling inclined to warn Marnie, "Be careful, watch out. Someone's coming along the corridor" (altruism).

Figure 5.16: Reflection



5.4 CONCLUSION

(a) A tertiary solution to the paradox of fiction (and the paradox of empathy)

Before appealing to the role of emotional simulation in either the real world or the cinema, we should consider at least two questions: namely, to what extent does the multi-level model of the emotion system outlined thus far act as a 'constraint' on, and an 'alternative' to, emotional simulation (see Table 5.9)?

(i) 'Constraints' on simulation

The first question has been addressed by reconsidering the associative network route to (cinematic) emotion. A reconsideration of associative networks from both a neurobiological and a connectionist perspective has yielded the following two points. First, it is plausible that both 'direct' perception and 'indirect' simulation utilise the same nodes in the mind/brain, the external perceptual information presented by fiction films making the internal activity of perceptual imagining largely superfluous. More specifically, the direct activation of nodes may serve as an affective prompt for emotional imagery, whilst our capacity to respond emotionally to this imagery may be dependent on a 'critical number' of associated nodes being (directly) activated.

It should be stressed that the same arguments could be made for the cognitive appraisal route to (cinematic) emotion. In a general sense, the results of emotional appraisal may play a crucial role in activating a corresponding emotion node in an associative network. More specifically, the negative arousal resulting from automatic appraisal may serve as a motivational prompt for reflective appraisal, whilst our capacity to respond emotionally to this appraisal may be dependent, once again, on independent instigation in the manner described.

(ii) 'Alternatives' to simulation (and theory)

The second question has been addressed by reconsidering the cognitive appraisal route to (cinematic) emotion. In light of this discussion, Currie's essentialist claim that imagination is simulation (key point 1) can be taken one step further with respect to emotional simulation. If the simulation of central states operates in a largely automatic, non-conscious fashion (key point 2), begins with the film itself (key point 3), and successfully bridges the theory/experience gap (key point 4), then it can be spelt out in terms of automatic appraisal - which, in turn, can be partially understood in terms of parallel constraint satisfaction, and so forth. Similarly, if the simulation of central states operates in a deliberate, conscious fashion, then it can be spelt out in terms of reflective appraisal. This essentialist claim can be approached from the opposite direction by appealing to the notion of *emergence*: viz., we can say that *from* appraisal 'emerges' simulation.

The same essentialist claim (1) can be made for the associative route to empathy. If the simulation of perceptual states operates in a largely automatic, non-conscious fashion (2), begins with the film itself (3), and successfully bridges if not the theory/experience gap exactly, then the gap between input nodes and emotion nodes (4), it can be spelt out in terms of automatic association - which, in turn, can be partially understood in terms of pattern association, and so forth. Similarly, if the simulation of perceptual states operates in a deliberate, conscious fashion, then it can be spelt out in terms of reflective association.

* * *

The main challenge to the essentialist claim that (nonconscious) simulation can be spelt out in terms of either (automatic) association or appraisal can be described as the *argument from design*. Although in retrospect it seems reasonable for us to refer to some of our emotional states as 'isomorphisms' of a target person's emotional states - operating in a largely 'offline' fashion, and so forth - the sceptic might argue that the term 'simulation' implies something altogether stronger: namely, that the emotional states in question have been brought about *in order to* replicate those of the target person. The question, then, is how do we extract the required element of design from the proceedings?

Although evolution by natural selection is emphatically *non*-teleological - that is, entirely devoid of goals and purpose - evolutionary theory allows us to sever the link between the notion of 'design' and human intention. Whether or not we regard our emotional states as 'simulations' of the target person's emotional states is ultimately dependent, perhaps, on whether we regard the capacity in question as a 'deliberate' *design feature* or an 'accidental' *byproduct*: viz., was the capacity selected primarily to give us an adaptive understanding (etc.) of other people's emotional lives (in which case our emotional states can be classified as 'simulations' proper), or is the capacity merely a by-product of an emotion system whose automaticity was selected primarily to give us an adaptive headstart in a competitive environment (in which case the generation of 'isomorphic' emotional states is merely an end-result of non-discriminatory processes)? It goes without saying that this is an open question.

Given, then, that we cannot extract the required element of design from the evolutionary account with any degree of certainty, we may need to look in a different direction altogether; indeed, we may need to appeal to human intention - and the consciousness that goes with it - after all. The flip-side of Currie's proposal that *most* simulation is done 'unintentionally' and 'at a subconscious level' is that *some* simulation is done 'intentionally' and 'at a conscious level'. Perhaps, then, we should reserve the term 'simulation' for those instances in which we *intentionally* and *consciously* attempt to 'imaginatively entertain' perceptions, thoughts, and feelings which are more relevant to the target person's situation than our own; that is (conscious) simulation should be regarded as 'simulation' proper.[20]

[20] What happens if we deliberately project ourselves into the place of the target person or character? Stotland (1969, pp.288-297) found that subjects who were instructed to imagine *themselves* in the place of a target person undergoing (apparently) painful heat treatment (the 'imagine-self' condition) generated greater palmar sweating responses and experienced greater anxiety (as measured by self-report) than control subjects who were simply instructed to watch the target person (the 'watch-other' condition).

Table 5.9: A tertiary solution: the relationship between automatic and reflective processing

	(1) automatic processing	**(2) reflective processing**	**constraints imposed by (1) on (2) ***
(1) associative network route	automatic association	reflective association (emotional imagery)	affective prompting, critical instigation
(2) cognitive appraisal route	automatic appraisal (primary appraisal)	reflective appraisal (reappraisal)	motivational prompting, critical instigation
emergent result of (1) and/or (2) **	(nonconscious) simulation	(conscious) simulation [= simulation proper?]	

N.B. This scheme does not make a distinction between central and acentral imagining: according to the argument outlined above, this distinction is primarily dependent on the information provided by the film-maker as opposed to the automatic and reflective processing undertaken by the viewer.

(b) Further applications

Although the scenes from *Psycho* and *Marnie* are brief instances which centre on the feeling of anxiety alone, the account of empathy and sympathy described above is intended to be applicable across the board; i.e., to different narratives from different films involving different emotions. One of the ways in which the account can be regarded is as an argument for the primacy of alignment; that is, an attempt to acknowledge the importance of the information presented by the film-maker.

(i) The case of the unfaithful spouse

Suppose that after the journey on the train described previously - during which we encounter the anxious stranger - we meet up with a friend at a restaurant. During dinner, our friend informs us that a mutual acquaintance is being betrayed by an unfaithful spouse. This type of case is described by Sober and Wilson (1998, p.234). They distinguish empathy from sympathy, by proposing a certain conception of sympathy: 'Suppose Walter discovers that Wendy is being deceived by her sexually promiscuous husband. Walter may sympathize with Wendy, but this is not because Wendy feels hurt and betrayed.'[21]

What would happen, though, if we watched a cinematic version of the case in question? In Adrian Lyne's *Fatal Attraction* (1987) - see Frame 5.11 - we are not aligned with the 'betrayed' wife Beth Gallagher (played by Anne Archer); rather, the first half of the film focuses on the affair between the 'sexually promiscuous' husband Dan (Michael Douglas) and the *femme fatale* Alex Forrest (Glenn Close). In this instance, it is plausible that our empathetic responses for the latter would interfere with the development and attribution of our sympathetic responses for the former.

Frame 5.11: The case of the unfaithful spouse: *Fatal Attraction* (1987)

(ii) The case of the condemned murderer

This point can be developed considering a less standard example. Suppose that we pick up a newspaper which someone has left on the adjacent table. Our interest is caught by an article about a man who is on death row for committing rape and murder. The question is: do we sympathise with the family of the victims or the perpetrator of the crimes? When reading a written account - which only provides us with ('degraded') symbolic information - we are sufficiently removed from the two sides to eliminate 'parallel' (i.e., empathetic) responses from the equation. In light of this, classifying our response to the parents of the victims as, say, 'sympathetic', and our response to the murderer and as, say, 'antipathetic'

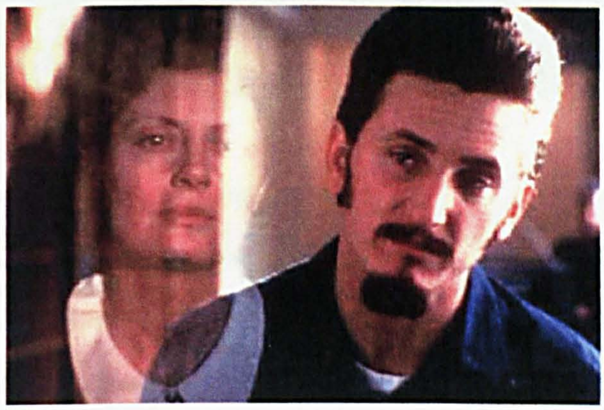
[21] In reply, Nichols (2001, pp.431-433) points out that 'a sophisticated empathy account can easily accommodate their case by claiming that we use our imagination to empathize with what Wendy would feel if she were to discover his infidelity.'

may be relatively straightforward. (Notice, however, that this classification pivots on a conception of sympathy and antipathy as primarily *cognitive* states.)

What would happen, though, if we watched a cinematic version of the case in question? A potential example is provided by Tim Robbins's controversial 1995 film *Dead Man Walking* (see Frame 5.12) - also discussed by Smith (1997, pp.424-425). Matthew Poncelet (Sean Penn) is on death row for the rape and murder of a young couple; he is befriended by Sister Helen Prejean (Susan Sarandon) who offers him spiritual guidance and support, whilst attempting to gain a stay of execution from the law courts. In a strict sense, what is unusual about our experience as viewers is *not* the fact that we may find ourselves empathising (and sympathising) with *both* the parents of the victims and Poncelet as the alleged perpetrator; according to the above account, this follows *automatically* from the processing of the information with which we are presented. Rather, what is unusual is the fact that we are presented with detailed information - *perceptual* as well as *symbolic* - from *both* of the sides in question. As one of the parents says bitterly to Sister Prejean, "I'm sure you've seen a side to Matt Poncelet that none of us has seen."

From our perspective, one of the most interesting scenes comes towards the end of the film. Poncelet breaks down in tears as he confesses to Sister Prejean that he is guilty of the crimes of which he is accused. In terms of attention and duration, this scene conforms to Plantinga's (1999) criteria for a 'scene of empathy'. Our empathetic response to Poncelet need not be considered as an example of 'perverse allegiance': to use Smith's phrase, we empathise with Poncelet 'in spite of' his acts. What is more, this 'in spite of' can be spelt out in reasonably concrete terms: the associative and appraisive processes in operation may be 'encapsulated' with respect to our knowledge, and moral evaluation, of Poncelet's character (his racist tendencies, for example) and the horrific nature of his crimes. In addition, our empathetic response may also stem from a certain cognitive limitation - a 'failure of the imagination', as it were - for it is only at the film's conclusion that we are shown a flashback of Poncelet and his partner committing the aforementioned crimes.

Frame 5.12: The case of the condemned murderer: *Dead Man Walking* (1995)



CHAPTER 6

Conclusion:
Solutions and Questions

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The project has focused on the paradox of emotional responses to fiction: the conundrum of how and why we respond emotionally to fictional characters and events, when we are consciously aware of their fictional (i.e., non-existent) status. In addition, the project has addressed a series of related paradoxes from both perceptual and emotional perspectives: the paradox of representation is concerned with the conundrum of how and why we perceive characters and events which are not physically present, whilst the paradox of empathy is concerned with the conundrum of how and why we respond emotionally to the fate of people who exist separately - in physical, kindred, and platonic terms - from ourselves.

The main strategy for solving all three paradoxes has been to revise the third proposition by removing existence beliefs - along with presence and relevance beliefs - from the perceptual and emotional equations. In the first part of this concluding chapter, I will outline the three main routes to (cinematic) emotion and the possible relations between them; for each route, my aim will be show how it operates independently of existence beliefs. In the second part of the chapter, I will provide suggestions for future research by asking a number of further questions.

6.1 SOLVING THE PARADOXES OF FICTION, REPRESENTATION, AND EMPATHY

(a) The associative network route to (cinematic) emotion

The first route to real world and cinematic emotion has been described as the associative network route (see Figure 6.1). The impact of emotional stimuli has been illustrated by considering film scenes in which a character is confronted by some sort of threat:

representative examples include Indiana Jones being confronted by a venomous rattlesnake in *Raiders of the Lost Ark*, Ripley being confronted by the monster in *Alien*, and a young soldier lying wounded on Omaha Beach in *Saving Private Ryan*. The impact of emotion cues, on the other hand, has been illustrated by considering the opening scene from *Jaws* in which the Watkins girl is confronted by an unseen shark.

The associative network route may operate in either a direct or an indirect fashion, corresponding to automatic and reflective processing respectively: from a neurobiological and a connectionist perspective, both perception and imagination involve the same regions of the mind/brain, or, to use Damasio's terms, they are both realised in the same 'image space'.

(i) Automatic association

Starting with the direct version, association can be understood as an automatic process which begins with the external world of the film: the principal elicitors of emotion are individual stimuli and multiple cues. In this instance, the absence of existence beliefs is compensated by the presence of *shallow inputs*. From a neurobiological perspective, shallow inputs resulting from the perceptual processing of an emotional stimulus (the so-called 'key') activate 'emotion induction sites' - in certain subcortical regions of the brain - which are 'preset' to respond to that particular class of stimulus (the 'lock'): in other words, the emotional impact of a stimulus can be explained in terms of the associative matching of a perceptual pattern with some sort of 'template' in the emotion system. From a connectionist perspective, shallow inputs resulting from the perceptual processing of emotion cues result in the activation of input nodes (or perceptual memories) and event nodes (or episodic memories) in an associative network; both processes can be understood in terms of parallel constraint satisfaction.

Table 6.1: Automatic association

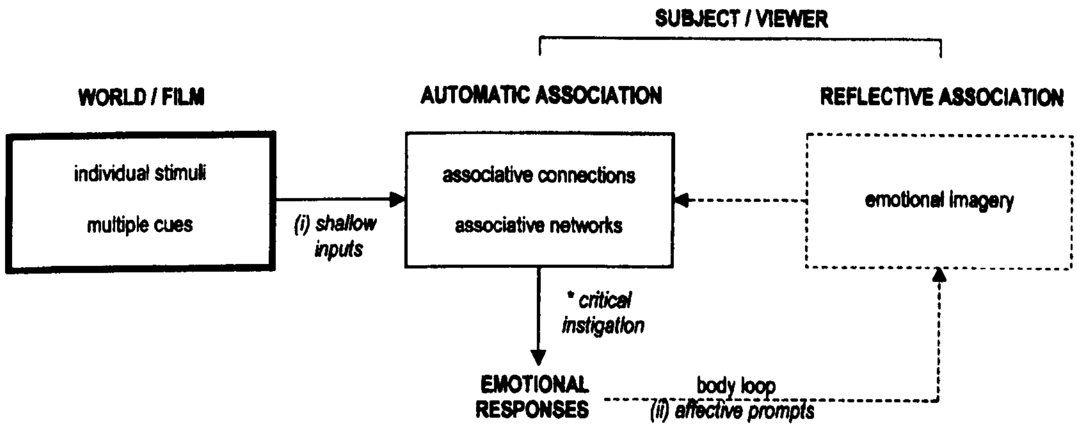
	induction stage (site of activation)	**reliance on existence beliefs?**
(1) associative connections (neurobiology)	subcortical regions (emotion-induction sites)	no: partial encapsulation / lock-and-key analogy
(2) associative networks (connectionism)	input nodes (perceptual memories) event nodes (episodic memories)	no: partial encapsulation / parallel constraint satisfaction

(ii) Reflective association

Moving onto the indirect version, association can be understood as a reflective process which begins with the internal world of the viewer's mind/brain: as 'intentional' and 'conscious' beings, we are capable of imagining the situations depicted by a film from an impersonal (acentral) perspective or from the personal (central) perspective of a character. Given that such a reflective process is likely to be sensitive to the situation's fictional status, the sceptic might argue that we are guilty of 'inconsistency' and 'incoherence'. In reply, the imagination theorist might argue that imagination should be understood as the capacity to 'entertain a proposition non-assertively' - that is, without existential commitment.

Either way, we still need to understand how such a capacity is constrained by the emotional content of the film on the one hand, and the emotional makeup of the viewer on the other. In this instance, the absence of existence beliefs is compensated by the presence of *affective prompts*. Following our initial emotional responses, somato-visceral feedback may activate appropriate 'memory structures' and 'thought patterns' in an associative network, thereby enabling us to generate emotional imagery in the manner described by Lang. Conversely, our capacity to respond emotionally to this imagery may be dependent on the instigation of a critical number of associated nodes; a factor which is largely determined by the automatic processing already described.

Figure 6.1: The associative (network) route to (cinematic) emotion



N.B. In the case of automatic association, the absence of existence beliefs is compensated by (i) the presence of shallow inputs. In the case of reflective association, on the other hand, the absence of existence beliefs is compensated by (ii) the presence of affective prompts, which, in turn, can be 'traced back' to (i) the presence of shallow inputs.

(b) The cognitive appraisal route

The second route to real world and cinematic emotion has been described as the cognitive appraisal route (see Figure 6.2). The impact of situational meaning was firstly illustrated by considering the scene from *The Beach* in which the three main characters are confronted by a non-existent shark, and secondly illustrated by considering the cases of the protective son and the compulsive thief from *Psycho* and *Marnie* respectively. Once again, the cognitive appraisal route may operate in either a direct or an indirect fashion, corresponding to automatic and reflective types of processing respectively: the relationship between the two must be understood in primarily cognitive and intentional terms.

(i) Automatic appraisal

Starting with the direct version, appraisal can be understood as an automatic process which begins with the external world of the film: namely, the primary appraisal of the emotional meaning of the depicted situation. In this instance, the absence of existence beliefs is compensated by the presence of *shallow inputs*. From a cognitive perspective, shallow inputs resulting from the perceptual processing of the situation may be filtered to either auto-appraisers (as examples of Darwinian modules), or the schematic model level of the mind (as an aspect of a multi-level model of the emotion system), thereby 'interfacing' with appropriate goal structures. In the case of basic emotions - especially those fundamentally related to survival such as fear and disgust - it seems reasonable to say that the appropriate goal structures are already 'on standby', readily activated by realistic representations. With respect to more complex emotions, on the other hand, the appropriate goal structures may need to be activated during the course of the film by means of the factors of (close) perceptual access and (sustained) spatio-temporal attachment. (Alternatively, goal structures may be constructed as and when needed, by using related examples from memory.)

Table 6.2: Automatic appraisal

	induction stage (state of goal structures)	**reliance on existence beliefs / adoption of goals?**
fear, disgust	on standby	no: partial encapsulation / diegetic effect
other emotions	not on standby	no: partial encapsulation / alignment

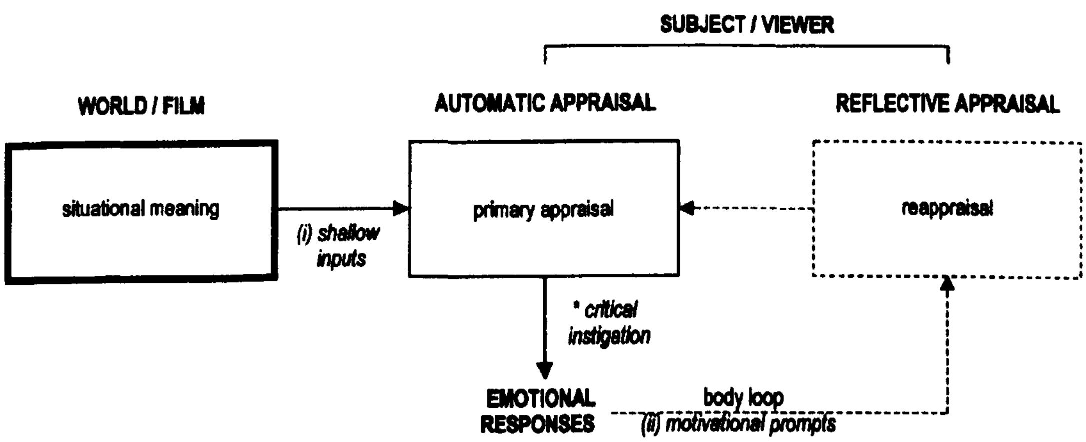
N.B. This scheme does not make reference to the notion of 'identification'.

(ii) Reflective appraisal

Moving onto the indirect version, appraisal can be understood as a reflective process which begins with the internal world of the viewer's mind/brain: as 'intentional' and 'conscious' beings, we are capable of (re)appraising the emotional meaning of the depicted situation. Given that such a reflective process is likely to be sensitive to the situation's fictional status, the sceptic might level the viewer with accusations of irrationality once again. At first glance, moreover, it seems that the sceptic really does have a case this time round for (re)appraisal cannot be straightforwardly understood as the capacity to 'entertain a proposition non-assertively', and so forth.

In this instance, the absence of existence beliefs is compensated by the presence of *motivational prompts*. Following our initial emotional responses, negative arousal may be fed back to the somatosensory regions of the mind/brain, thereby contributing to an overall feeling of anxiety. Considering that we are likely to transfer this arousal / feeling to the characters and events on the screen - albeit through some sort of attribution error - the most natural way of reducing it is to keep our eyes rooted on the screen and devote our conscious (attentive) processing resources to appraising the pros and cons of the situation in question, whilst hoping that everything turns out for the best. Conversely, our capacity to respond emotionally to this appraisal may be dependent on the emotion system being at a critical level of activation; a factor which is largely determined, once again, by the automatic processing already described.

Figure 6.2: The cognitive appraisal route to (cinematic) emotion



N.B. In the case of automatic appraisal, the absence of existence beliefs is compensated by (i) the presence of shallow inputs. In the case of reflective appraisal, on the other hand, the absence of existence beliefs is compensated by (ii) the presence of motivational prompts, which, in turn, can be 'traced back' to (i) the presence of shallow inputs.

(c) The simulative route

The third and final route to real world and cinematic emotion has been described as the simulative route. Although this route may operate in either a direct or an indirect fashion, the key question is: how does it relate to the two routes already described?

(i) Nonconscious simulation

The direct version can be understood by making an essentialist claim: if emotional simulation operates in an unintentional and nonconscious fashion, begins with the film, and successfully bridges the theory/experience gap, then it can be spelt out in terms of either automatic association or appraisal (see Table 6.3). Considering this claim, it is possible that when we use the term 'simulation', we are actually referring to associative and appraisive processes which have already been taken into account. In this type of case, then, perhaps the term is largely superfluous.

Table 6.3: The simulative route to (cinematic) emotion: nonconscious simulation

	(1) automatic processing
(1) associative network route	**automatic association (connections, networks)**
(2) cognitive appraisal route	**automatic appraisal (primary appraisal)**
emergent result of (1) and/or (2)	**nonconscious simulation**

N.B. Nonconscious simulation (highlighted by blue shading) can be thought of as the emergent result of automatic association and/or appraisal (dark grey shading) which, crucially, operate independently of existence beliefs.

(ii) Conscious simulation

Understanding the indirect version is more problematic. To begin with, a similar essentialist claim can be made: if emotional simulation operates in an intentional and conscious fashion, then it can be spelt out in terms of either reflective association or reflective appraisal (see Table 6.4). Despite this claim, the sceptic might argue that the term 'simulation' implies a certain element of design: for instance, a viewer could claim that they deliberately generated emotional imagery and/or deliberately (re)appraised the meaning of the depicted situation, *in order to* replicate the mental states of a character. In this type of case, then, perhaps the term can be used in a legitimate and meaningful sense.

Table 6.4: The simulative route to (cinematic) emotion: conscious simulation

	(1) automatic processing	**(2) reflective processing**	**constraints imposed by (1) on (2)**
(1) associative network route	automatic association (connections, networks)	reflective association (emotional imagery)	affective prompting, critical instigation
(2) cognitive appraisal route	automatic appraisal (primary appraisal)	reflective appraisal (reappraisal)	motivational prompting, critical instigation
emergent result of (1) and/or (2)	nonconscious simulation	conscious simulation [= simulation proper?]	

N.B. Conscious simulation (highlighted by blue shading) can be thought of as the emergent result of reflective association and/or appraisal (dark grey shading). In turn, each instance of reflective processing can be traced back to the influence of automatic processing (light grey shading), which, to repeat, operates independently of existence beliefs.

6.2 ASKING FURTHER QUESTIONS

(a) Different films (and different emotions)

In order to develop a multi-level model of the emotion system, the project has focused on the primary emotion of fear and the related emotion of anxiety. Similarly, in order to control the independent variables, the project has discussed relatively simple examples of fear sequences from action, horror, and war films by directors such as Spielberg, and relatively minimalist examples of suspense and surprise sequences from the pure cinema of

Hitchcock. Having deliberately narrowed the scope of enquiry and simplified the filmic examples whenever possible, a first avenue of further research lies in applying the multi-level model of the emotion system to a wider - and more complex - variety of emotions and films.

(i) Primary (basic) emotions

Although I have suggested how the multi-level model of the emotion system might be applied to the primary emotions of anger, sadness, and happiness, a possible research project would be to ascertain whether or not the accounts in question could be developed to a higher level of specificity and detail: a possible case study would be the film genre of (melo)drama and the emotion of sadness. From a neurobiological perspective, such an emotion may be relatively intractable - for a number of reasons already described. From a connectionist and functional perspective, however, it is plausible that associative network models and appraisal theories of equal specificity and detail could be developed: specific research topics might include the types of emotion cues employed by film-makers and the role of episodic memories on the one hand, and the types of appraisals performed on the other.

(ii) Secondary (complex) emotions

As we have seen, primary (basic) emotions can give rise to secondary (complex) emotions in at least two ways. First, a primary emotion such as anger may be elaborated by the (cognitive) appraisal that, say, 'the object of the anger is a social inferior', thereby generating the secondary emotion of indignation. Second, two or more primary 'emotion modules' can be combined to produce a secondary emotion: for instance, the 'happiness' and 'sadness modules' may give rise to the emotion of nostalgia. In light of these principles, another research project would be to demonstrate how relatively simple cognitive and affective components - which, crucially, operate independently of existence beliefs - might be combined to form emotional states of ever increasing complexity.

(b) Different viewers

Considering that a certain universality of emotional response between viewers has been assumed throughout the project, a second avenue of further research lies in accounting for personal differences (see Patrick Hogan, 2003, and Greg M. Smith, 2003). Significantly, every aspect of the multi-level model of the emotion system - and every stage of the emotional process - allows for a certain degree of flexibility.

(i) Universal versus personal associations

To what extent does one viewer's filmic associations resemble another's, and to what extent do they differ? Starting with universal similarities, some of the connections in the associative network have been 'biologically prepared' over the course of human evolution: examples include the connections between either the 'snake' or 'spider node' and the 'fear node'. In the extreme case of the ophidio- or arachnophobic, the connections between the respective nodes may be strongly weighted. (The process of desensitization may involve the weakening of these connections.) Moving on to personal differences, other connections in the associative network - probably the majority - are established during the individual's lifetime through socio-cultural experience: for instance, a film panned by the critics might nevertheless elicit a reasonably profound response in a viewer by using a particular location which uniquely related to an emotive event from their past. The impact of personal differences may be minimised, however, by a high level of emotional redundancy: if emotion cue 1 fails to activate a node in the associative network of viewer A, then emotion cue 2 may succeed, and if cue 2 fails with respect to viewer B, then cue 1 may succeed, and so forth.

(ii) Universal versus personal appraisals

To what extent is one viewer's appraisal of a film's situational meaning similar to, and different from, another's? According to appraisal theory, each type of emotion corresponds to a particular 'person-environment relationship'; each type of situational (or relational) meaning corresponds to a core relational theme. With respect to film viewing, the environmental variables are provided by the 'pseudoenvironment' of the film, whilst the personal variables are provided by the viewer themselves. This suggests the following possibility. The more a situation depicted by a film refers to a core relational theme from either human evolutionary history (phylogeny) or contemporary human experience (ontogeny) - and the more it relates to human survival - the greater the likelihood that a corresponding appraisal pattern already exists in the viewer (and exists universally). If this is the case, then the appraisal of situational meaning can be performed automatically and is likely to be similar from one viewer to another. Conversely, the more a depicted situation departs from a core relational theme, the lesser the likelihood that a corresponding appraisal pattern already exists. If this is the case, then the appraisal of situational meaning may require the flexibility and sophistication afforded by reflection, and with these properties comes the possibility that appraisal will be different from one viewer to the other.

(c) Different paradigms

Having focused on what could be described as 'subpersonal' (nonconscious) mechanisms and processes for the majority of the project, a third avenue for future research lies in recognizing the level of the person (and the role of consciousness). Rather than proposing a series of research questions, however, it seems fitting to address this issue - and conclude the overall project - by acknowledging what I regard as the most potentially significant opposition to the project as it stands: a way of thinking which began with Wittgenstein, which is implicit in Radford's original discussion of the paradox of fiction, and which has been recently revived in the field of art and film theory.

(i) A prophylaxis against theory

In their introduction to *Wittgenstein, Theory and the Arts*, Richard Allen and Malcolm Turvey (2001) attempt to apply what they describe as 'a prophylaxis against theory'.[1]

[1] The following discussion will take Allen and Turvey's interpretation of Wittgenstein - as opposed to Wittgenstein himself - as its starting point.

Following Wittgenstein's early and later philosophy, Allen and Turvey begin by making a distinction between - and thereby *segregating* - two paradigms (see Table 6.5). The first paradigm is the natural sciences. The main objective of the natural sciences is to explain 'empirical phenomena', whilst the principal method of investigation is described as *theory*. The authors propose that theories possess two basic features: first, in order to unify 'apparently diverse phenomena', they appeal to an 'underlying principle'; and second, this underlying principle is usually 'hidden from view'. (Alternatively, this method can be described as 'causal explanation'.) The second paradigm is philosophy. The main subject-matter of philosophy is 'questions of sense and meaning', whilst the principal method of investigation is *conceptual clarification*. In contrast to theory, conceptual clarification is concerned with what is 'already in place' and 'open to view'. (This method leads to 'justificatory explanation'.)

In the second part of their introduction, Allen and Turvey describe a fundamental shift in Wittgenstein's thinking. Although Wittgenstein's early philosophy - notably, the *Tractatus Logico-Philosophicus* - acknowledged the distinction between the natural sciences and philosophy, it relied on theory in the following sense: in order to account for the nature of human language, it appealed to an underlying principle (or structure) which was hidden from view. In contrast, Wittgenstein's later philosophy - notably, the *Philosophical Investigations* - rejects theory altogether. In light of this, Allen and Turvey advance two main arguments. The first argument concerns the *autonomy of linguistic meaning*. The meaning of psychological concepts cannot refer to neurobiological, connectionist, or cognitive processes; i.e., causal processes which are hidden from view (and not apparent to the language user). If they did refer to such processes, then 'language users would not be able to employ them in the first place.' (p.13) Instead, the meaning of psychological concepts is determined by their use in everyday life; factors which are decidedly open to view (but which need to be drawn out in various ways). The second argument concerns the *distinction between reasons and causes*. The authors apply the lessons of human language to the domain of human psychology and intentional (rule-governed) behaviour: 'Just as the meaning of a word cannot be unknown to the language user who uses it correctly ... the reason for an agent's action cannot be unknown to the agent in the way that a cause is.' (p.16) According to this argument, a reason is typically 'authoritative and complete': it can be cited by an agent in order to justify acting in such and such a way.

Table 6.5: Segregating paradigms

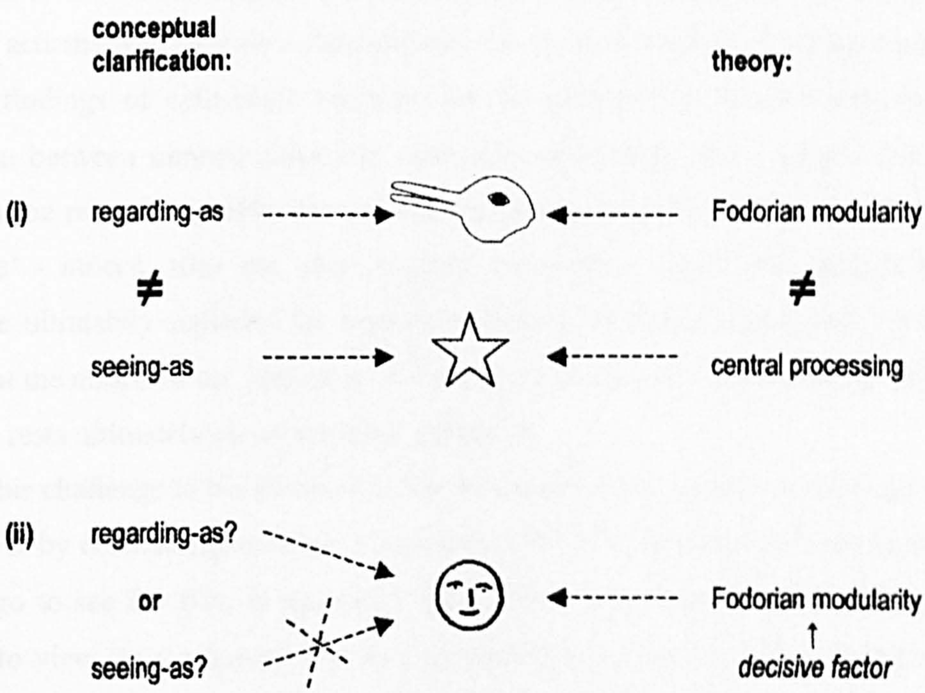
	subject matter (hidden from / open to view)	principal method of investigation
paradigm 1: **natural sciences**	causes: neurobiological, connectionist, cognitive	'theory' (causal explanation)
paradigm 2: **philosophy**	(i) meaning: psychological concepts	conceptual clarification (justificatory explanation)
	(ii) reasons: intentional (rule-governed) behaviour	

(ii) A theory against prophylaxis

According to Allen and Turvey, the preceding project overplays the role of subpersonal mechanisms and processes: it offers an *explanation* of how we perceive and respond emotionally to fiction film. Conversely, the project underplays the role of the person: the project should be offering a *justification* for why we respond in the way we do. (We cannot illuminate the nature of our perceptual and emotional relationship to film - and related forms of audiovisual media - by appealing to neurobiological, connectionist, and cognitive levels of explanation.) In reply, let us attempt to apply what could be described as 'a theory against prophylaxis' by addressing each of their key arguments in turn.

Argument 1: the autonomy of linguistic meaning. For the sake of argument, let us assume that linguistic meaning is autonomous in the way described: that is, referring to psychological mechanisms and processes cannot clarify the meaning of a psychological concept such as the verb 'to see'; this meaning is constituted entirely by the way we use the concept in everyday life. In spite of this assumption, two points can be made. First, the autonomy of linguistic meaning - as a philosophical constraint on our understanding - need not be final (see Figure 6.3). As we have seen, it seems reasonable to suggest that referring to Fodorian modules improves our understanding of Wittgenstein's notion of 'regarding-as' (in relation to our perception of the Jastrow duck-rabbit), whilst referring to central processing improves our understanding of his notion of 'seeing-as' (in relation to our perception of the Pole Star). In light of this Fodorian reading, moreover, it seems reasonable to claim that a philosopher who applied the notion of 'seeing-as' to our perception of the picture-face would be incorrect in some significant respect. (Similarly, with respect to the seeing theory, the research of LeDoux suggests that Turvey's employment of the notion of 'regarding-as' conflates perception with emotion on the one hand, and should be counter-balanced by the notion of 'seeing-as' - which brings in the role of central processing - on the other.)[2]

Figure 6.3: Challenging the autonomy of linguistic meaning



Argument 2: the distinction between reasons and causes. For the sake of argument, let us assume that the 'reasons' we cite - at the personal level - in order to justify our actions and feelings must be based on factors which are readily available to us; they cannot refer to 'causes' - at the subpersonal level - which are unknown. In spite of this assumption, it does not follow that the factors in question are the correct ones. This point could be illustrated by citing a multitude of psychological experiments; perhaps the most

[2] In addition, the autonomy of linguistic meaning - as an example of a humanistic phenomenon - may not be generalizable. It is plausible that the majority of humanistic practices - including the ritual of film viewing - are constituted only in part by conventions, rules, and so forth. In a related fashion, the project has not been concerned with psychological concepts per se; rather, it is has been concerned with a psychological *phenomenon* - namely, our perceptual and emotional engagement with film - which, in a certain sense, exists independently of the viewer and their use of language.

relevant and vivid examples come from Gazzaniga and LeDoux's research on split-brain subjects cited previously (see Figure 6.4).

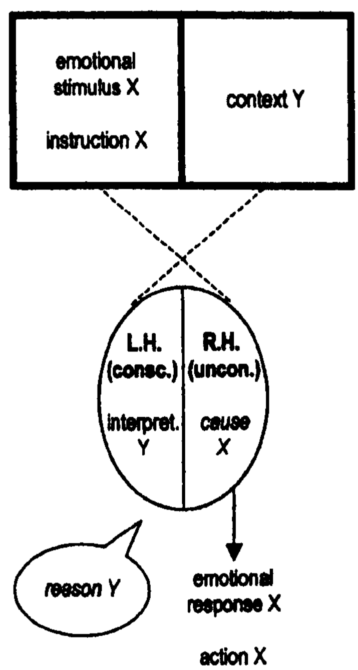
To recap, Gazzaniga and LeDoux presented either an emotional stimulus or an instruction to act to the subject's right hemisphere - the side of the brain usually associated with visuo-spatial capacities - but not to the left hemisphere - the side usually associated with language and thought. On the one hand, the non-conscious operations of the right hemisphere - assessing the emotional significance of the stimulus and responding to the instruction to act - are explicable in terms of causes. On the other hand, the conscious operations of the left hemisphere - continually providing a narrative for why the subject feels and acts the way they do - are explicable in terms of reasons. The significant point is that the findings of split-brain research can be extended to normal subjects, and the distinction between nonconscious and conscious processing: they suggest that on many occasions the reasons we offer for our feelings and actions are neither 'authoritative' nor 'complete' - indeed, they are often entirely erroneous - whilst our appeals to reasons should be ultimately replaced by appeals to causes. Although Allen and Turvey might object that the notion of an 'incorrect' or 'unknown reason' is a contradiction in terms, this objection rests ultimately on an arbitrary definition.

This challenge to the distinction between reasons and causes can be extended to the film viewer by considering two basic questions. The first question concerns actions: "Why did you go to see the film in question?" Given that Allen and Turvey would regard our decision to view, say, a horror film as a straightforward instance of an intentional (rule-governed) behaviour, they might consider reasons along the lines of, "I am a fan of the horror genre, the director, the principal actor, and so forth." Although these reasons might be largely 'authoritative' and 'complete', it is plausible that our decision would be influenced by causal mechanisms and processes which are largely unknown: according to the organizational hypothesis, for instance, film viewing plays a significant role in the organization of our emotion system.

The second, and decisive, question concerns the emotions: "Why did you respond to the film in such-and-such a way?" Our emotional engagement with film is clearly of interest to Allen and Turvey who both address the paradox of fiction in their work; with respect to the current discussion, they might consider reasons along the line of, "I found the film frightening and/or disgusting", or by pointing to the frightening and disgusting features of the proverbial monster. A less trivial and more complete answer, however, would not lead us to a straightforward instance of intentional (rule-governed) behaviour:

our capacity to respond emotionally to the film would be primarily dependent upon, and constrained by, the causal mechanisms and processes described above. This point can be made most concisely and forcefully by reiterating that the induction stage of the emotional process would be mediated by the subcortical regions of the central nervous system, whilst the response stage would be mediated by the involuntary branch of the peripheral nervous system; in other words, those parts of the nervous system which are 'below' and 'beyond' intentionality and consciousness. It should be reiterated, however, that our emotional responses might be shaped by social, cultural, and gender-specific display rules (which are readily available to us) and either reduced or increased by certain detachment and engagement strategies (which are initiated at the level of the person); topics for future research, then, include the *clarification* of the rules and strategies in question.

Figure 6.4: Challenging the distinction between reasons and causes



Having challenged each of the main arguments, I should state that I do not expect a committed Wittgensteinian to be entirely, or even partially, convinced; I will conclude, therefore, by offering the basic intuition (see Table 6.6). Although Wittgenstein acknowledges the role of the brain and the nervous system, Radford acknowledges the role of 'brute facts' and 'biological reasons', and Allen and Turvey acknowledge the role of causal processes with respect to certain types of perception, it is possible that they quite simply *underestimate* the importance - and the pervasive influence - of the factors in question; their habit of treating the person as a separate entity, therefore, amounts to a form of Cartesianism in all but name. Alternatively, the subpersonal (nonconscious) and the personal (conscious) - the respective domains of causal and justificatory explanations - are so interdependent that their segregation is untenable in a pragmatic, if not a strictly philosophical, sense. In light of this, the most viable line of enquiry is to engage in the type of enterprise which has characterised this entire project: only through integrating the paradigms of the natural sciences and philosophy, only through integrating neurobiological, connectionist, cognitive, and intentional levels of explanation, and only through integrating theory and conceptual clarification will we be able to reach a full understanding of our perceptual, cognitive, and emotional relationship to film and other forms of audiovisual media.

Table 6.6: Integrating paradigms

	level of explanation	**conceptual integration**
(1) subpersonal (nonconscious)	(i) neurobiological	'theory' (causal explanation)
	(ii) connectionist	
	(iii) cognitive	
(2) personal (conscious)	(iv) intentional (future research): display rules, detachment / engagement strategies	clarification of rules / strategies (justificatory explanation?)

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