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### Citation for published version

Trimingham, Melissa (2011) How to Think a Puppet. Forum Modernes Theater, 26 . ISSN 0930-5874.

### DOI

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## How to think a puppet

Melissa Trimingham, University of Kent

**Abstract:** There is a growing awareness of the relevance of cognitive neuroscience to performance studies, but little attention has been paid to puppetry in this context. In an attempt to open up the field of puppetry to *McConachie's 'cognitive turn'*, a cognitive approach is here taken to *Blind Summit's 'The Table'*. The solo puppet protagonist *Moses* is described here as a 'brain on legs', a lively, funny and poignant figure who hovers on the brink of epic greatness but remains forever fixed to his table top. 'The Table' is analysed from three angles: firstly the use of environmental 'affordances' in James Gibson's sense; secondly kinesthetic empathy as described by Antonio Damasio, Shaun Gallagher et alia; and thirdly, intimately linked to both, emotion. It is by virtue of *Moses's* limitations that we are able to glimpse our own potential as human beings, richly embedded as we (and his operators) are in a world of limitless 'affordances' or 'opportunities for action' in James Gibson's sense; and able to grow cognitively and emotionally through our contact with others.

The opening up of performance to cognitive studies was prepared towards the end of the 1980s with the gradual turn from reliance on semiotic analysis of the stage towards phenomenological approaches as a tool for the rigorous analysis of first person experience.<sup>1</sup> During the same period cognitive neuroscientists turned their attention to consciousness and began to study subjective experiences of the mind<sup>2</sup>. Panksepp, a leading affective neuroscientist and perhaps the best known researcher into emotions through his practical research into the neural circuits and chemical changes in the brain, describes the need for flexible approaches to understanding the whole person in relation to the problem of consciousness:

.....science only clarifies functional parts of a complex phenomenon. Other disciplines, from art to philosophy, are needed to reconstruct an image of the whole...<sup>3</sup> (emphasis in original)

As neuroscience started to listen to other disciplines, a reciprocal field of cognition studies opened up that takes account of developments in hard (neuro)science, and this field embraces psychology, philosophy, anthropology- indeed potentially almost any humanities discipline, including, recently, performance studies. These scholars are interested in neuroscience for what it tells us about how we may cognize our being in the world, tending to draw on controversial essentialist insights into how the mind works<sup>4</sup>. This dialogue promises to advance embodied understandings of the mind deriving from philosophy, by using firmer evidence from neuroscience about how our consciousness is formed.<sup>5</sup> Whilst the dialogue is perhaps rather one sided currently,<sup>6</sup> in performance studies it is becoming evident that in the face of cognitive understandings, many writers may have to modify well-worn theories rooted within psycho-analytic and social constructivist thinking.<sup>7</sup> Scenography and puppetry

have always yielded more readily to phenomenological rather than (for example) Freudian or Marxist interpretations, and it seems a natural development to examine more closely the ‘first person’ approaches within cognitive neuroscience, in an attempt to tease out key aspects of how meaning emerges on stage through its visual and haptic components. One key aspect, and increasingly so in the contemporary theatre, is puppetry.

Steve Tillis in 1992 made an exhaustive critique of the then current and largely semiotic definitions of the puppet and what he judged to be the hitherto unworkable taxonomies based either on variations in manipulating techniques or on diachronic categorisations through history and/or geography.<sup>8</sup> His study illustrates the difficulties in defining the enormous and diverse field that is puppetry and warn against any assumed definition of a ‘puppet’: these include rod, string, glove, ‘table top’ and Bunraku puppets.<sup>9</sup> Moreover Tillis’s book dates from 1992 before digital puppetry and computer aided design had been developed, all of which further complicate notions of what a puppet is or might be<sup>10</sup>. To these varieties of ‘2D’ puppets we might add simple cut out, shadow and UV puppets.

Jurkowski offers perhaps the most useful definition of a puppet since he acknowledges the semiological and ultimately dramaturgical impact of what he describes as variations in the ‘power sources’:

...[T]he speaking and performing object makes temporal use of the physical sources of the vocal and motor powers, which are present outside the object. The relations between the object (the puppet) and the power sources...change all the time and their variations are of great semiological significance.<sup>11</sup>

Importantly for my purpose, Jurkowski’s definition is able to encompass a relatively recent phenomenon, the ‘manipulator’ who is part puppeteer and part visible ‘independent’ performer interacting with it<sup>12</sup>. ‘Manipulating’ is a development from the visible puppeteer who began to appear on our stages after World War Two. In manipulating the ‘relations between the object (the puppet) and the power sources...change all the time’ with, as Jurkowski notes, changed semiological- and I would add, dramaturgical- significance. In de-emphasising what a puppet is in favour of what a puppet does, Jurkowski prepares the ground for a cognitive approach. I argue that it is the intentionality of operator and audience that ultimately makes the puppet ‘do’. In this sense recent developments in cognitive science, which is closely allied to phenomenology and first person experience, is a promising tool to analyse kinesthetic, empathic and emotional responses when a puppet moves. I should offer a caveat: this article is largely concerned with the study of a single anthropomorphic puppet and his ‘manipulators’. Although an attempt will be made towards the end to widen the scope of the cognitive insights here presented, a full study is outside the scope of this article. I am concerned here to extract a few key pointers which may map out an initial pathway in this largely untried approach to puppetry.

Jurkowski draws attention to the ‘motor powers’ outside the puppet/object that move it (i.e. the motor powers of the operator). The somato-sensory area of the brain appears to be closely allied, as we shall see, to emotion, empathy and memory.<sup>13</sup> Tillis’s syncretic analysis is in the end limited by the failure to explain the ‘psychological desire’ of the audience to ‘imagine that the perceived object does, in fact, have life’ (Tillis 1992:64). The psychology of the audience often reduces theorists to vague speculation of what they think is happening<sup>14</sup> whereas neuro-science may offer a more precise tool of analysis. The singular puppet I have chosen to look at through this lens is Moses: the marionette porté or ‘table top puppet’ (Illust.1) who stars in *The Table* (2011), the creation of Blind Summit Theatre. As cognitive studies is a lens to look at Moses, so Moses is our lens (and not as a universal representative of ‘the puppet’) to look at puppetry. In my case study, Moses, a table top

figure, a little man with a large head and tiny legs and no clothes- moves through physical sources 'present outside the object'- the three operators who grip his head, body, feet and hands.

In addition to 'manipulating', The Table is an example of what Roman Paska describes as the 'Primitivist' rather than 'Illusionist' use of puppetry. In 'Illusionism' the 'puppet-as-object' succumbs to pure character representation and 'the signifying puppet dematerialises into pure simulation' (Paska in Francis: 2011: 138-9). Paska argues that the twentieth century brought a sea change from 'Illusionism' to 'Primitivism': puppets became flexible and resonant theatrical tools where, as Jukowski describes it, 'the performer does not serve the puppet anymore; he makes the puppet serve him and his ideas' (Jurkowski 1990:17). Similarly Didier Plassard has argued that the physical relationship between puppet and puppeteer has changed from 'vertical' to 'horizontal', that is the manipulator and manipulated hold more equal presence on stage.<sup>15</sup> The Table exploits- and deconstructs- this 'new' dramaturgy of the puppet. In (post)modern puppetry typically the human figure, most frequently but not always as operator, appears alongside the puppet, complicating audience perception and multiplying levels of interpretation through the visible juxtaposition of living flesh and the plastic object that flesh causes to move. Moses is the star but 'his' existential life problems that are the life blood, poignancy and black humour of this piece only exist by virtue of the presence of his three operators (and silent female visitor to his table) and only have meaning in relation to them- and the audience. As always in theatre, the metaphor is not a literary or abstract one but one acted out in flesh and blood and objects in front of our eyes.

What is particularly apposite in this discussion on puppets and cognition is that Moses is a huge head on a small body (see Fig.1). He threatens to perform to us his epic on the last twelve hours of Moses's life, in 'real time', the ostensible reason for the performance. Before we realise who he is and what he intends, his large cardboard head and tiny body impacts upon us. The audience reception of Moses can be treated as a rich 'conceptual blend' that resonates throughout the piece. Conceptual blending is a notion borrowed from cognitive linguistics<sup>16</sup> and the 'network model' is adapted here to explain the physical and tactile and essentially phenomenological 'blend' that Moses offers us.<sup>17</sup> Conceptual blending describes the 'conceptual integration'<sup>18</sup> of existing mental spaces (broadly comparable to thoughts) which make up new mental spaces. According to Fauconnier and Turner a new blend begins with (however many) input spaces, and 'cross space mapping' connects what is common between the input spaces to create the 'generic space'. (The process is not linear and isolated though it has to be described that way- blending and cross mapping is a continual and complex process.) The fourth mental space is the creative leap: the 'blended space' or 'the blend' i.e. a new mental space. New 'emergent structure' is developed through the blend so that 'composition of elements from the inputs makes relations available in the blend that do not exist in the separate inputs'.<sup>19</sup> In the words of Edwin Hutchins, 'As is the case with all blends, cross-space mappings between conceptual and material elements link the two spaces and selective projection from the inputs into the blended space give rise to emergent properties.'<sup>20</sup> When we first see Moses on the table, one 'input space' is, I suggest, the large headed figure/puppet, and another 'input space' is our 'body image' which is the perception of our own bodies we carry in our heads, i.e. we feel our own heads and especially our faces to be much huger than they actually are.<sup>21</sup> Moses reminds us of our unnoticed shaping of our large headed 'window' to the world, the world which is also our own 'table top'. This is what Fauconnier and Turner describe as 'the flash of comprehension'.<sup>22</sup> Moses, though a very different 'other', is also us and despite the bizarre nature of his appearance we feel strangely empathic with him. In all puppets that work particularly well, the exact choice of material nuances the meaning. The huge head is made of corrugated card, a massive and impressive bulk, but essentially empty. The

unseen kinks and whorls of the familiar material of corrugated card, faintly ridged on the surface and carefully crafted into the angled and rigid shapes making up a head, remind us of a brain on legs.

The table itself, comprising the entire staging of this piece, present throughout, and Moses's 'stage', home and entire universe, is, in Lakoff and Johnson's definition, a basic level concept.<sup>23</sup> Basic level concepts are a way the mind categorises objects: these concepts do not change, and they derive from bodily experience. Basic level concepts are the 'lowest' generic form of an object that we can visualise, for example, 'chair' –or table- rather than 'furniture': to put it succinctly, 'categories of the mind fit the categories of the world' (emphasis in the original).<sup>24</sup> They are "human sized" and depend 'not on the objects themselves, independent of people, but on the way people interact with objects, the way they perceive them, image them, organize information about them, and behave towards them with their bodies'.<sup>25</sup> The 'visualisation' of basic level categories derives from 'handlings' and interaction with the environment. In this sense the word 'visualise' is very deceptive and inadequate, and ignores the physical and haptic dimensions of thought. Alva Noë describes seeing as 'much more like touching than it is like depicting'.<sup>26</sup> In handling a puppet like Moses there is for the puppeteer a curious mixture of the haptic and the visual, internal proprioception and an external sense of touch/vision. Working a puppet draws on sensori-motor memory, especially the stringed marionette and figures half worn and incorporating the hand(s) and/or feet of the puppeteer, or, as in Moses, figures grasped and manipulated by up to three operators (a Bunraku style puppet or a marionette porté). For the puppeteer, the effort of moving the puppet into positions that resemble the actual creature they are imitating inevitably and always draws upon such body memory, as well as an acute visual and haptic empathy with what is being seen by the audience<sup>27</sup>: the better they are able to embody these memories the better the puppetry produced. It is no accident that Moses moves or rather is moved on a 'basic level category' object, a table, returning both puppeteer and audience member to a 'human sized' object, rehearsing early stages in the brain's development of concepts- up and down, over and under, edges and surfaces, and so on.

Neuro-scientist Antonio Damasio believes: 'There is no such thing as a pure perception of an object within a sensory channel...To perceive an object, visually or otherwise, the organism requires both specialized sensory signals and signals from the adjustment of the body, which are necessary for perception to occur'<sup>28</sup> (i.e. the shift of the head upwards in order to see a bird in flight, the bending of the body into a chair, the curving of a hand to work a puppet's head). Even witnessing such interaction, as an audience, is a similar experience: this motor element in perception or proprioception survives vividly when we even think of that object<sup>29</sup>: 'The records we hold of the objects and events that we once perceived include the motor adjustments we made to obtain the perception in the first place and also include the emotional reactions we had then. They are all registered in memory.....You simply cannot escape the affectation of your organism, motor and emotional most of all, that is part and parcel of having a mind'.<sup>30</sup> These proprioceptive, haptically strong body memories are writ large upon the stage, especially in the use of puppets : so too is affect or the rousing of emotion, prompted as Damasio says by an object- or puppet.

Leaving aside for the time being the important element of emotion that Damasio attaches to motor memory here, my suggestion is that Moses has connection via motion (of puppet, puppeteer and watcher) with basic level concepts. Similarly, Moses also reminds us of basic patterns of motion such as the impulse of SOURCE-PATH-GOAL. These patterns were first identified by the philosopher Mark Johnson<sup>31</sup> and developed through his work with linguist George Lakoff.<sup>32</sup> These patterns develop from babyhood onwards and are now accepted by many neuroscientists (but by no means all<sup>33</sup>) as the structural scaffolding, via metaphorical mappings, for abstract thinking: in other words

our reason and our imagination are founded in a necessary and essentialist bodily relation with, and use of, the material world.<sup>34</sup> We cannot, they maintain, do much thinking without metaphor, and they ground metaphor in bodily experience. Metaphors identified by Lakoff and Johnson include many 'spatial relations concepts and image schemas'.<sup>35</sup> One such is the container image schema: for example when we say 'the bee is in the garden' we are 'imposing an imaginative container structure on the garden'<sup>36</sup>; such structure emerges from numerous experiences when young such as being wrapped up in a blanket as a new born baby, learning to pour water in and out of beakers in the bath, and playing hide and seek. Another is the strong 'front and back' image schema : in an expression such as 'the cat is behind the tree' we are actually imposing a front and back on a tree, which is directly derived from our own body image of front and back and where we are placed in relation to the tree. Moses continually operates on the level of these basic patterns of bodily orientation, confined as he is on a very limited surface in the centre of a void. Prepositions for Moses seem particularly important as he shows us around his flat, rectangular world : he needs the geometry of his table top to have any sense of space. When Moses shows us around his 'garden' on the table top, we feel he is 'in' it ; moreover he has a very clear idea when standing at the edge of the garden/table that he is contemplating the 'garden' spread out before him. The container metaphor is strongly present throughout: the table itself of course is Moses's 'container' in the void of the stage that surrounds him. Lakoff and Johnson demonstrate how metaphorical thinking derives from such bodily experience and it begins before birth moving in the womb. Moreover the very perception of objects is shaped by bodily interactions with them and it is this that The Table, by reason of Moses's incredibly limited physical world, plays with.

When you and I look at an object outside ourselves, we form comparable images in our respective brains. We know this well because you and I can describe the object in very similar ways, down to fine details. But that does not mean that the image we see is the copy of whatever the object outside is like. Whatever it is like in absolute terms, we do not know. The image we see is based on changes which occurred in our organisms-including the part of the organism called brain- when the physical structure of the object interacts with the body. The signalling devices located throughout our body structure-in the skin, in the muscles, in the retina, and so on, help construct neural patterns which map the organism's interaction with the object. The neural patterns are constructed according to the brain's own conventions, and are achieved transiently in the multiple sensory and motor regions of the brain that are suitable to process signals coming from particular body sites, say the skin, or the muscles, or the retina. The building of those neural patterns or maps is based on the momentary selection of neurons and circuits engaged by the interaction. In other words, the building blocks exist within the brain, available to be picked up and assembled. The part of the pattern that remains in memory is built according to the same principles....

...There is a set of correspondences between physical characteristics of the object and modes of reaction of the organism according to which an internally generated image is constructed.<sup>37</sup>

The development of the basic capacity to grasp and make use of the environment is the shared and essentialist basis of different cultures and civilisations, but the capacity to do this does not determine the nature of cultures themselves.

The theories of James Gibson, an 'ecological psychologist', go some way to explaining why cultures develop so differently and so richly.<sup>38</sup> Gibson coined his own word in connection with 'useful' features of the environment: 'affordances'.<sup>39</sup> Pass-throughability (openings that one can pass through), climbability (places one can climb on), and swimability (substances that one can swim in) are all 'affordances' in Gibson's sense: we might add the 'graspability' of a piece of rag, a stick of wood that becomes a puppet.

This theory is grounded on information, invariant properties of optic, haptic, acoustic structure that are relevant to an organism's action capabilities. Information is out there and available to a suitably attuned organism.<sup>40</sup>

One way of looking at a puppet is that it is an ‘affordance’ to the puppeteer. Affordances describe material substance with the extra dimension of use and potential use. ‘Ordinary physical units won’t do’<sup>41</sup> since each feature has to be measured relative to the organism and is specific to the organism.<sup>42</sup> The notion of affordances goes some way to describing the shaping of the mind by physical interaction with the environment and the variety of cultures which emerge. The organism is not responding to the environment via a ‘pre-programmed’ structure in the brain : to gloss Gibson, the stick offers itself as graspable because we have hands. Even if we do not handle or touch the object (or puppet) at the time of seeing it, because of our embodied minds, we mentally gear into its possible affordances via its shape and form, and our perception of it is constructed, as Damasio described above, by body memory of interaction with the environment (the ‘climabilities’ and ‘passthroughabilities’ etc.). Arguably a puppeteer draws strongly on these (potentially creative) ‘gearings’ into the physical world both in the physical act of performing and in communicating with an audience.

The puppet is a conduit for the puppeteer, an interface between operator and environment, a tool for a performer discover interesting and amusing and unexpected affordances in the environment. This is part of the exploratory play of rehearsal with a puppet. Ironically, although Moses’s world is the stage, and in theory a world of boundless imagination, in this case, at first glance, it is a world of no affordances, in Gibson’s sense, whatsoever. Indeed Mark Down, director, described the process of prolonged rehearsing on the table as ‘pretty grim’.<sup>43</sup> As an audience at the start of the performance we see little prospect of a decent puppet show and the threatened epic poem looms large. Moses’s ‘niche’<sup>44</sup> or set of affordances is, as he touchingly shows us round it, a flat surface a short distance from the floor about (as he calculates) half a metre by one metre, with four surrounding ‘cliffs’ or ‘falling off’ places<sup>45</sup> and that is that: no views, no horizon, no vision, no imagination and we fear, no possibilities. As it turns out however, the puppeteers of course find plenty of rich ‘imagined affordances’ on the table top- not only its surface (which is in turn racked with wind, coated with ice, transformed into a record player turntable that slowly revolves Moses round, a CD player that throws him off, and a running machine that he can’t keep up with) but also they exploit the whole mysterious and metaphysical (or existential) dimensions of his world (on stage and off stage, the air he sometimes floats in, the cavernous space beneath and around the table top). Moses’s body schema (in a human, we remember<sup>46</sup>, this is the non-conscious emergent movement patterns of one’s body- such as ‘source path goal’ already described- deriving from interaction with the environment) is nonexistent. To state the obvious, the body schema is nonexistent because he is a puppet: but Moses’s poignant tragedy is that he could never have a body schema, and thus a mind, because his outer/material environment, his niche, so essential to the formation of consciousness, is so impoverished of affordances. Later on he jokes that his Stanislavkian ‘back story’ is a cardboard box.

Moses is a puppet that is moved by and close to the body and he seems to draw our attention to the primary metaphors as defined by Lakoff and Johnson, all deriving from bodily experience. Primary metaphors are metaphors such as affection is warmth, important is big, more is up, difficulties are burdens, causes are physical forces- and knowing is seeing. He does this because he is smaller than ourselves and we re-experience, whether as puppeteers or audience, a tiny child’s body and its relationship to the environment and objects, experience that we have forgotten and from which these metaphors derive. Puppets expose the origin of primary metaphor ‘thinking’ that has become obscured by habit. For example a child (and a puppet) has to try very hard to move something ‘heavy’. This child experience develops via ‘conflation’ into the adult idea that difficulties in life are heavy burdens. ‘Conflation’ therefore is the development of a child’s thinking beyond the physical literal experience : another example is actually seeing something (‘I see it’) conflating into the

primary metaphor 'Knowing is Seeing' ('I see what you mean').<sup>47</sup> Puppets, I suggest (and here I risk a generalisation) do not usually operate on this post-conflation level of metaphorical thought: they tend to be very literal in their actions. Moses literally tries to push away physically the problem that appears in his world in order to rid himself of it- the silent woman reading. This is appealing to some audience, since the literalism can be a source of great humour in puppetry, and irritating to others.<sup>48</sup> Nevertheless, I suggest the appeal of the miniature, the delight in things made on a small scale, is in all of us. It holds a charm that is hard to explain except through this appeal to primary level metaphors, the very basis of our thought. A miniature physical object reminds us of a child-like level of operating in the world that we have forgotten but which comforts us with its familiarity.

Moses shares this child-like connection and also, despite his addressing an audience, inhabits an infinitely lonely world. Into this world suddenly breaks another: a being, a possibility of change from his solipsistic, narcissistic life. A woman comes and sits at his table, and reads a book.<sup>49</sup>

Moses's sudden introduction to an empathic other neatly parallels Gallagher's 'disruptive moment' that mirror neurons introduce into 'the supposed indifferenciation of the earliest hours' of an infant.<sup>50</sup> Mirror neurons are hard scientific evidence of the shaping of our consciousness through interaction with others. It is now a respected theory (though again not universally accepted) that from soon after birth the brain is capable of empathising with the action of another through the physical process of firing mirror neurons in the same area of the brain that would activate if the witness were actually themselves doing the goal orientated action being viewed, for example reaching for a cup.<sup>51</sup> It seems that we only become fully human through seeing or sensing others.<sup>52</sup> In cognitive terms, this means that empathy is a naturalistic process that does not, in contrast to Simon Baron-Cohen's theory of mind, involve inference or judgement of the other person's state of mind.<sup>53</sup> Empathy within mirror neuron theory is an interactive mode and in Thompson's words it involves 'the direct pairing or matching of the bodies of self and other'.<sup>54</sup> In other words, if the theory is right, we cannot help but empathise with another.

And so a silent woman comes and sits at Moses table, opening up the possibility of an empathic other, and a potential for growth in Moses's sense of self. At first outraged by the cheek of this intruder, Moses gradually senses the possibility of his own self emerging differently, warmly, empathically, from this encounter. Sadly it seems this is an encounter from a parallel universe, as the woman, blind to his addresses, suddenly ups and leaves as strangely as she arrived without ever noticing him. There is no 'direct pairing or matching' of bodies. They exchange no speech. It is not just a fresh perspective on his loneliness that such a loss entails, it is that the Beckettian world of the table top which he inhabited more or less contentedly and innocently before now seems unbearably bleak to himself as well. In short it offers no possibility, ever, of change, growth and 'seeking', either through the barren environment he is in or solitary existence he leads.

In the beginning, that is, at the time of our birth, our human capacities for perception and behavior have already been shaped by our movement. Prenatal bodily movement has already been organized along the lines of our own human shape, in proprioceptive and cross-modal registrations, in ways that provide a capacity for experiencing a basic distinction between our own embodied existence and everything else. As a result, when we first open our eyes, not only can we see, but also our vision, imperfect as it is, is already attuned to those shapes that resemble our own shape. More precisely and quite literally, we can see our own possibilities in the faces of others. The infant, minutes after birth, is capable of imitating the gesture that it sees on the face of another person. It is thus capable of a certain kind of movement that foreshadows intentional action, and that propels it into a human world.<sup>55</sup>

Moses 'has' no distinction between his own embodied existence and everything else; there are no shapes that resembled his own shape; he is not given the chance to see his own possibilities in the faces of others. Moses is drawn towards a human world and then torn back into existential grief and a



world of no other faces. The humour in this piece prevents a descent into bathos. We are dimly aware of the irony that the puppeteers behind Moses do have a clear distinction between their embodied existence and that of the puppet; that they are perfectly attuned to the shape that resembles their own shape, and see their possibilities in the faces of each other- and of the puppet. They habitually imitate the gesture, via the puppet, that they see on the face of the other person; their intentional actions are directed into a puppet and propel it into a human world- where it fails always and ever to be human. In this case, the puppeteers have made use of minimal affordances in the environment to express complex meanings that in the end can never be reduced to language- or to mere physicality.

Puppets have the capacity to draw attention to the existence of the ‘lived body’ alongside the ‘objective body’, and Moses does exactly this. The objective body is our body (and that of others, and indeed of a puppet) considered as an object- we all have the capacity for this external perspective on the workings of the body : it is how the body is treated in all manner of disciplines such as physiology or neurology.<sup>56</sup> The lived body on the other hand is the embodied body, our personal experience of the body we inhabit. Within Evan Thompson’s interactive model of consciousness<sup>57</sup>, as Gallese says ‘[e]mpathy is deeply grounded in the experience of our lived body’.<sup>58</sup> The puppeteer experiences their own ‘Leib’ or ‘lived body’ by, through and in the puppet and at the same time perceives the puppet itself as ‘Körper’ or ‘objective body’. The use of a material object in this way to draw attention to our predicament as material objects ourselves adds layers of complexity to the meanings offered.

If the brain finds stability to perform complex and creative thought through the constant presence of the body<sup>59</sup> the material bodies of puppets have the ability to remind us that this stability is only seemingly robust and frighteningly fragile when it is disturbed. We are in the end material ourselves. Gallagher and Zahavi describe a game of tennis. ‘Your body tightens in order to return the ball in a masterful smash, but suddenly you feel a sharp and intense pain in your chest. Your smashing opportunity is lost and the pain is now demanding all your attention....There is nothing that reminds us of our embodiment (our vulnerability and mortality) as much as pain’.<sup>60</sup> Gallagher and Zahavi see this experience as one that objectifies the body suddenly and gives us access to what is normally lost to us: ‘the smooth functioning of our body in perception and action as the constant and pervasive support system for our cognitive life’.<sup>61</sup> There is nothing more fragile than Moses’s body as he stands in an agony of loneliness as the woman retreats from his table.

Emotion in relation to the puppet takes us beyond- or further into- its materiality. Gibson concentrates on the physical or ecological level of psychology, and so offers us only a limited insight into the formation and experience consciousness which is imbued with emotion.<sup>62</sup> For humanity, working of materials is so much more than physical. The puppet for example, as a material ‘affordance’ to the puppeteer, clearly involves emotion and thought, adding cognitive complexity beyond simple physical interaction.

The objective body of a puppet, clearly, can arouse empathy: it does this via, as Gallese suggests above, the lived body that animates it and the audience that watches. In Gallagher’s book *Brainstorming*, he interposes ‘A Short Robotic Interlude’ amidst his exploration of consciousness via motion, intersubjectivity, emotion, empathy and language.<sup>63</sup> At one point scientists describe a project where robots are used to help autistic children relate to the world since they avoid the subtle, unpredictable and potentially confusing social behaviours of humans. However Gallagher states: ‘Currently there is good evidence to suggest that mirror neurons, which are activated when we see others engaged in intentional actions, are not activated when we see mechanical things do the things that could be done by people’.<sup>64</sup> There is however every reason for mirror neurons to fire when we see a puppet reach for something, because it is not mechanical: when held, it takes on, to a greater or

lesser extent, the embodied force of the puppeteer's bodily movements, more obviously since puppeteers are rarely hidden in contemporary performance, and activate the body memory of the audience- with some of the unpredictability and pleasing redundancy of organic motion that robots lack.

Panksepp<sup>65</sup> identifies basic animal (mammalian) emotions (which Moses experiences) as anger and fear of abandonment ; the basic emotional systems are rough and tumble play (which is comparable to Moses on his turntables and running machines) and the 'seeking' mechanism, that is, the 'high' we get from fully engaging in an activity we really enjoy ('seeking' which can also lead to drug abuse) : arguably Moses gets a taste of this when he meets the silent woman, though it is snatched from him. Emotions are, basically, chemical releases into the brain.<sup>66</sup> Whether as Panksepp claims emotions originate deep in the brain or in the somato-sensory cortex (which is where Damasio, in contrast to Panksepp, would place emotions) matters not for my main point here, namely that the physical and emotional are linked, each affecting the other: 'Emotive circuits change the sensitivities of sensory systems that are relevant for the behavioural sequences that have been aroused'.<sup>67</sup> In turn body memory can trigger past emotion. This reveals something about the emotional engagement that puppets arouse, and may have relevance to other modes of 'low' or popular performance, namely masks, clowning and slap-stick. Because puppets have a limited physical range distilled from the subtleties of the somato-motor system of the puppeteer, they always begin their physical encounter with us differently, and hence, I would argue, provoke a different level of emotional response from, say, Hamlet or Hedda Gabler. The quality of their physical movement is comparable, and linked, to their tendency to operate at the pre-conflation level that precedes metaphorical language explored earlier. This does not make them childish, but it often makes them child-like, that is, simple (in the best possible sense) and direct conduits of basic emotion. Puppets can be emotionally engaging characters, but our empathy may be rooted in the nature of the physical gestures they are able to make, which ultimately are always child-like. Ronnie Burkett's crafted string puppets (such as those in *Happy 2001*) or Handspring Theatre's marionette portées (such as the lead characters in *Or You Could Kiss Me* (2010)) overlay sophisticated and thus 'post conflation' language so that, as well as having complex emotional lives, they also seem to engage with us at a child-like emotional level that can be upsetting, and even deeply disturbing. In the case of Handspring's *Or You Could Kiss Me* the child like dimension is sensitively dealt with, even exploited through the vulnerability of the leading characters. Burkett, despite his brilliance in operating the puppets, does not always get the balance right when he gives his characters such full adult lives, including sexuality. *Faulty Optic's* roughly (but ingeniously) made Mabel (*Snuffhouse Dustlouse* [1991]1999) busies herself one handedly, clumsily, obsessively- and pointlessly- around her dimly lit rubbish strewn house, her sad existence deriving from an abusive childhood. The emotion aroused by a puppet, an object in motion, is connected to the type of movement it makes. The puppet keys us emotionally into an affective level that only puppets- and objects- can touch.

Fauconnier and Turner's conceptual blending, which was adapted earlier as a model to analyse audience reception of Moses's appearance, is rigorous, scholarly and insightful: it is also largely abstract (ignoring the body) and almost entirely linguistic. The challenge is to penetrate non-linguistic 'thought', that is, the 'thought' that arises with no verbalisation at all, such as sculpting, weaving or painting: or creating and watching a puppet.

Mandler's work indicates that in babies, thought precedes language and can exist without being translated into words.<sup>68</sup> A promising start on expanding the notion of conceptual blending into non verbalised thought has been made by Hutchins's demonstration of the way material anchors can expand thinking.<sup>69</sup> Inspired by Hutchins's work on navigation as a complex space of 'shared

cognition' dependent on material objects or instruments , Evelyn Tribble has applied this to Shakespeare's Globe Theatre.<sup>70</sup> Puppetry is an example of a space of shared cognition almost entirely dependent on expanding thought through the use of material objects. This is evident in Blind Summit rehearsing *The Table* as the puppeteers play, endlessly improvising with the puppets and props discovering new affordances, some of which move the piece along, and some of which prove dead ends that cannot dramaturgically be absorbed and so are abandoned.<sup>71</sup> Their rehearsal is a space of active and shared cognition where thought is developed through objects in a social space: children do this in play continually<sup>72</sup> but it is also apparent in performance. Here the space of shared cognition is obvious, active and energetic. It is often signalled by laughter in the audience as performers push ideas further in response to audience reaction. When an extract from *The Table* was performed at the Wellcome Collection's 'Objects of Emotion'<sup>73</sup> Moses (in deconstructive mode) was demonstrating what can go wrong in the connection between puppet and puppeteer and, after sliding around the surface of his table and illustrating various other cardinal sins of poor puppeteering, the hapless Moses not only floated away off his surface but travelled further and further up the aisles of the lecture theatre. The audience were fully contributing to the shared space of cognition with the puppeteer as they encouraged him to push the idea to extremes.

In exploring a cognitive approach to puppetry I have done so largely through a specific example of *The Table*, arguably well suited to such an analysis. In doing so I have referred in passing to other puppeteers and companies but the caution I exercised in doing so makes me fully aware of the difficulties Tillis demonstrated so long ago, that exceptions can usually be found to any a generalisations about a 'puppet'. Even so, I believe the cognitive analysis could be usefully applied widely within puppet and object theatre to help our understanding of its enigmatic dynamics, and this is an attempt to open up the field to the 'cognitive turn'. Some general principles are possible to point the way.

Ideas are not necessarily expressed in language: meaning may be expressed visually, experienced haptically, and may never become articulated in words. This is much harder to grasp and justify than a superficial reading suggests. It demands carefully unpacking it in terms of consciousness, the sense of self, Damasio's 'feeling of what happens', and the phenomenological moment of so-called non thinking.<sup>74</sup> Since 90% of the mind's activities is, neuroscience claims, subconscious (and not in a Freudian sense) I suggest that theatre has the power -momentarily, richly, and sometimes delicately- to expand our consciousness into these unperceived reaches of the mind. In this way we experience on stage the very essence of creative thinking and the imagination in action, a moment that can subsequently be analysed if we wish in terms of conceptual blending, metaphorical truth, and basic schemas of thought. With this in mind puppetry, as a physical medium of communication, can key into what is normally lost to us, so that we notice both the normally unremarked and also precarious nature of our self hood. Hutchins claims that stability amidst cognitive complexity can emerge from material anchors in conceptual blends, objects that extend thinking out into the material world, and the stronger the anchor the more daring the brain can be in its blending.<sup>75</sup> Puppetry's 'conceptual blends' and those of our protagonist Moses, are indeed daring, imaginative and complex, and the more so, as Hutchins might suggest, because of their anchoring in environmental affordances, materials and the lived and living body.



<sup>1</sup> It is not surprising that scholars whilst beginning investigations in phenomenology progress to the insights of cognitive neuroscience: 'Indeed there is a remarkable convergence between the two traditions [of phenomenology and cognitive science] not simply on the topic of intersubjectivity, but on virtually every area of research within cognitive science, as a growing number of scientists and philosophers have discussed'. Evan Thompson, 'Empathy and Consciousness' in Evan Thompson (ed) *Between Ourselves*, second person issues in the study of consciousness, Thorverton UK and Charlottesville USA, 2001, pp.1-32, p. 2.

<sup>2</sup> Notable leaders in this field are F. Varela, E. Thompson and E. Rosch, *The Embodied mind: cognitive science and human experience*, Cambridge, Mass., 1993; Antonio Damasio, *Descartes' Error: Emotion, Reason and the Human Brain*, London, [1994]1996 and *The Feeling of What Happens; body, motion and the making of consciousness*, London, [1999] 2000; Vittorio Gallese, 'The Shared manifold Hypothesis: From Mirror Neurons to Empathy' in Evan Thompson (ed), *Between Ourselves. Second-person issues in the study of consciousness*, Thorverton UK and Charlottesville USA, 2001, pp.33-50; and Shaun Gallagher, *How the Body Shapes the Mind*, Oxford, 2005.

<sup>3</sup> Jaak Panksepp, *Affective Neuroscience: The Foundations of Human and Animal Emotions*, Oxford, 1998, p.3.

<sup>4</sup> See for example Jonathan A. Lanman, 'How "Natives" Don't Think: The Apotheosis of Overinterpretation' in Harvey Whitehouse and James Laidlow, *Religion, Anthropology and Cognitive Science*, Durham, North Carolina, 2007, pp.105-132. Lanman's application of 'cognitively costly' and 'cognitively optimal' representations in the mind problematises but by no means resolves what he rightly considers to be overly simple interpretations of Captain Cook's visit to (and death in) Hawaiian Islands in 1779.

<sup>5</sup> See for example Shaun Gallagher and Dan Zahavi, *The Phenomenological Mind: an introduction to philosophy of mind and cognitive science*, London and New York, 2008.

<sup>6</sup> Whilst there have been recent UK conferences and symposia where neuro-scientists were invited to share a platform with artists we are a long way from artists addressing a room full of neuro-scientists eager to discover what the arts can offer them. These events include 'Kinesthetic Empathy : Concepts and Contexts', Manchester April 2010; 'Objects of Emotion', Wellcome Collection, London, 2012; 'Affective Science and Performance' symposium, University of Kent, September 2012; and 'Cognition Kinesthetics and Performance: Interdisciplinary Dialogues', Institute of Contemporary Arts, London, September 2012.

<sup>7</sup> The stress is on modify, but by no means abandon: see Elizabeth F. Hart, 'Performance, Phenomenology and the Cognitive Turn', in: Bruce McConachie and Elizabeth Hart (eds) *Performance and Cognition: theatre studies and the cognitive turn*, London, 2006, pp. 29-51.

<sup>8</sup> Steve Tillis, *Toward an Aesthetics of the Puppet : Puppetry as a Theatrical Art*, New York, 1992. In this seminal study of the aesthetics of the puppet Tillis takes a synchronic approach to what is common in the art, builds his own aesthetic of the puppet on the 'ontological paradox' (p.66) which he identifies as the 'double vision' we have when watching puppetry- the oscillation between the illusion of life and the apprehension of an object.

<sup>9</sup> See also Penny Francis, *Puppetry A Reader in Theatre Practice*, Basingstoke, Hampshire, 2012, pp. 49-74.

<sup>10</sup> He addresses this in 2001: Steve Tillis, 'The Art of Puppetry in an Age of Media Production', in: John Bell (ed), *Puppets Masks and Performing Objects*, MIT Press, Cam., Mass., pp172-185.

<sup>11</sup> Henryk Jurkowski, *Aspects of Puppet Theatre*, London, 1988[1983], pp.79-80.

<sup>12</sup> See Paul Piris, *The Rise of Manipulating. The Puppet as a Figure of the Other*, unpublished PhD thesis, Central School of Speech and Drama, 2011, to whom I owe much for identifying the phenomenon of 'manipulating' and tracing its history. An example is 'Twin Houses' by Compagnie Mossoux- Bonté and the work of Neville Tranter both of whom Piris analyses: and of course *Blind Summit* which forms the backbone of this article.

<sup>13</sup> Vittorio Gallese and George Lakoff, 'The Brain Concepts: the Role of the Sensory-Motor System in Conceptual Knowledge', in: *Cognitive Neuropsychology* 22.3 (2005), pp. 45-79 and Damasio [1999] 2000, p. 147-8 and p. 161.

<sup>14</sup> See Tillis 1992: pp.59-66 for examples of this.

<sup>15</sup> D.Plassard 'Marionette Oblige: Ethique et Esthétique sur la Scène Contemporaine', in: *Théâtre/Public- la Marionette? Traditions, Croisements, Décloisonnements*, Vol 193 (2009), pp.22-25. See Piris pages 16-17.

<sup>16</sup> See Gilles Fauconnier and Mark Turner, *The Way We Think : Conceptual Blending and the Mind's Complexities*, New York, 2002, pp.40-50.

<sup>17</sup> Fauconnier/Turner, p.40-4. Bruce McConachie adapts the broad notion of conceptual blending into embodied experience to explain the phenomenon of the actor. See Bruce McConachie, *Engaging Audiences. A Cognitive Approach to Spectating in the Theatre*, New York, 2008.

<sup>18</sup> Fauconnier/Turner, p.40.

<sup>19</sup> Fauconnier /Turner, p.42.

<sup>20</sup> E. Hutchins, 'Material Anchors for Conceptual Blends', *Journal of Pragmatics* 37 (2005) pp.1555-1577, p.1561

<sup>21</sup> Our sense of our own body is called our 'body image'. For an explanation of the difference between body schema (which controls our ability to move) and body image (our more or less conscious view of our own body) and a history of the blurring of these terms, see Shaun Gallagher, *How the Body Shapes the Mind*, Oxford, 2005, p.19.

<sup>22</sup> Fauconnier/Turner, p.44.

<sup>23</sup> George Lakoff and Mark Johnson, *The Embodied Mind and its challenge to Western thought*, New York, 1999, pp.26-44.

<sup>24</sup> George Lakoff [and Zoltán Köecses], *Women Fire and Dangerous Things*, Chicago, 1987, p.34.

<sup>25</sup> *Ibid.* p. 51.

<sup>26</sup> Alva Noë, *Action in Perception*, Massachusetts, 2004, pp. 72-3.

<sup>27</sup> This sense of kinesthetic empathy in the audience has been explored in relation to dance: see Matthew Reason and Dee Reynolds, 'Kinesthesia, Empathy, and Related Pleasures: An Inquiry into Audience Experiences of Watching Dance', in: *Dance Research Journal*, 42.2 (2010) pp.49-75.

<sup>28</sup> Damasio [1999] 2000, pp.147-8.

- <sup>29</sup> Gallagher does not accept this aspect of Damasio's theory: see Gallagher 2005, p.135.
- <sup>30</sup> Damasio [1999] 2000, p.148.
- <sup>31</sup> Mark Johnson, *The Body in the Mind : The Bodily Basis of Meaning, Imagination and Reason*, Chicago and London, 1987.
- <sup>32</sup> Lakoff and Johnson , 1999.
- <sup>33</sup> See Gallagher 2005, p.133-136, and Aarre Laakso, 'Embodiment and Development in Cognitive Science' in : *Cognition Brain and Behavior*, XV.4 (2011), pp.409-425.
- <sup>34</sup> See Jean Mandler, *How to Build a Baby:11. Conceptual Primitives*, in: *Psychological Review*, Vol 99.4. (1992), pp. 587-604.
- <sup>35</sup> Lakoff and Johnson, 1999, p.117.
- <sup>36</sup> *Ibid.*, p.117.
- <sup>37</sup> Damasio [1999]2000, pp.320-1.
- <sup>38</sup> James Gibson, *The Ecological Approach to Visual Perception*, Boston, 1979.
- <sup>39</sup> See Teemu Paaavolainen 'From Props to Affordances: an Ecological Approach to Theatrical Objects', in: *Theatre Symposium*, Vol.18 (July 2010), pp.116-134.
- <sup>40</sup> J.A. Scott Kelso, *Dynamic Patterns. The Self-Organization of Brain and Behavior*, 1995, p. 189
- <sup>41</sup> *Ibid.* p.195.
- <sup>42</sup> See also Alva Noë, *Action in Perception*, Cambridge, Mass./ London, 2004. Noë is generally supportive of Gibson.
- <sup>43</sup> Interview conducted with Mark Down at Jackson's Lane Community Centre, London, 2 April 2012.
- <sup>44</sup> Gibson 1979, p.128.
- <sup>45</sup> *Ibid.*p.132.
- <sup>46</sup> See p. 5 of this article.
- <sup>47</sup> Lakoff /Johnson 1999, pp.48-50.
- <sup>48</sup> This further suggests a connection between puppet humour and slapstick, and may explain the appeal of both to autistic children.
- <sup>49</sup> In later versions of this performance such as the 'The Other Seder', Jackson's Lane Community Centre, April 2012, details of this interaction changed but the essential observation remains valid.
- <sup>50</sup> Gallagher 2005, p.84.
- <sup>51</sup> Evan Thompson, 'Empathy and Consciousness' in Thompson, 2001, pp.1-32 ;and Gallese 2001, pp.35-39.
- <sup>52</sup> Thompson 2001, pp.6-20.
- <sup>53</sup> *Ibid.*, pp.10-11.
- <sup>54</sup> *Ibid.*, pp.9.
- <sup>55</sup> Gallagher 2005, pp.1.
- <sup>56</sup> Gallager and Zahavi 2008, pp.135.
- <sup>57</sup> Thompson 2001.
- <sup>58</sup> Gallese 2001, pp.43.
- <sup>59</sup> Noë 2004, p.214; Damasio [1999]2000, pp.141.
- <sup>60</sup> Gallagher and Zahavi 2008, p.147.
- <sup>61</sup> *Ibid.*, pp.148.
- <sup>62</sup> Neuroscientists have criticised him for this. See Kelso 1995, pp.194. Similarly Gibson's limitaitons as well as his strengths are highlighted by Roy D. Pea, 'Distributed Intelligence and designs for education' in : Gavriel Salomon (ed), *Distributed Cognitions : Psychological and Educational Considerations* Cambridge, 1993,pp.47-87, especially pp.51-3.
- <sup>63</sup> Gallagher 2008, pp.156-170.
- <sup>64</sup> Gallagher 2008, p.157. There is research taking place on our ability to empathise with avatars and CIGs: see for example Hunt, D., Moore, J., West, A., Nitsche, M. "Puppet Show: Intuitive Puppet Interfaces for Expressive Character Control.", in : *Medi@terra 2006, Gaming Realities: A Challenge for Digital Culture*, Athens 4-8 (October 2006),pp.159-167.
- <sup>65</sup> Panksepp, 1998.
- <sup>66</sup> For Jaak Panksepp, an emotion 'is not dependent on sensory inputs. It is an endogenous urge of the brain' Panksepp 1998, p.290: chemicals originating from the lower brain levels activate other parts of the brain and he offers hard evidence to support this. Damasio on the other hand does not accept this as the origin of emotion.
- <sup>67</sup> Panksepp 1998, p.49.
- <sup>68</sup> See Mandler 1992.
- <sup>69</sup> Edwin Hutchins, *Cognition in the Wild*, Camb.Mass/London, 1995 and Edwin Hutchins, 'Material Anchors for Conceptual Blends' in : *Journal of Pragmatics*, 37 (2005), pp.1555-1577.
- <sup>70</sup> Evelyn Tribble, *Cognition in the Globe: Attention and Memory in Shakespeare's Theatre*, Basingstoke, 2011.
- <sup>71</sup> I was privileged to watch Blind Summit in rehearsal adapting 'The Table' for the performance 'The Last Seder' at Jackson's Lane Community Centre April 2012.
- <sup>72</sup> See Chris Sinha, ' Objects in a Storied World: Materiality Normativity, Narrativity', in: *Journal of Consciousness Studies*, 16 (6-8) (June-August 2009), pp167-190.
- <sup>73</sup> See note 6.
- <sup>74</sup> See Bert O.States, 'The Phenomenological Attitude' in Janelle Reinelt and Joseph R. Roach (eds) *Critical Theory and Performance*, Ann Arbor, 1992, pp.369-379, p.370.
- <sup>75</sup> Hutchins 2005, pp.1562 ; see also Pea, in: Salomon1993, pp.64-5 and pp.76-7.