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Use of the Enhanced Cognitive Interview and a Modified Cognitive Interview to Improve the Eyewitness Recall of Older Adults

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Abstract

As the proportion of older adults in the population grows it is expected that this group will be increasingly likely to witness criminal activity and report it to the police. To date, however, older adults and older adults who display signs of cognitive impairment have received minimal attention in the eyewitness literature. The present thesis was concerned with addressing these limitations. Specifically, it reviewed the difficulties impaired and non-impaired older adults encounter when recalling an event, and aimed to enhance the quality and quantity of their recall using the Cognitive Interview (cf. Fisher & Geiselman, 1992) and a modified version of the Cognitive Interview, in which the *change perspective* mnemonic was omitted (cf. Holliday, 2003a,b). This mnemonic is often controversial (Boon & Noon, 1994) and may be challenging for older adults (Herman & Coyne, 1980). Before examining such issues, the thoughts and suggestions of those who actually interview older adults were considered. In Study 1, English police officers were asked to complete a questionnaire about the interviewing techniques they use with older witnesses, the challenges encountered with this group, and their attitudes about using a Cognitive Interview with older witnesses. Furthermore, because research about officers' perceptions about older witnesses is limited, officers' attitudes toward this group were explored. Over half of the officers believed older witnesses to be less reliable and less thorough than younger adult witnesses. In addition, the number of officers who stated that the Cognitive Interview was helpful with older witnesses was equivalent to the number of officers who reported that the Cognitive Interview was unhelpful with this group. Study 2 compared the quality and quantity of older adults' recall for a video-taped event using a typical police interview (the Structured Interview; cf. Köhnken, 1993), a Cognitive Interview, and a modified Cognitive Interview. Old-old (75-95-years) adults' recall was found to be less complete and less accurate than that of young-old (60-74-years) adults, which was less complete and less accurate than that of young (17-31-years) adults. Contrary to the beliefs of many officers surveyed in Study 1, the Cognitive Interview and modified Cognitive Interview improved recall across every age group. Specifically, the Cognitive Interview and modified Cognitive Interview increased the number of correct Person, Action, Object and Surrounding details reported, without increasing the number of incorrect or confabulated details recalled. These age and interview effects remained when interviews were re-scored using a coding system that reflected police officers' decisions about the investigative relevance of details. Study 3 replicated the results of Study 2, using young (18-31-years) and young-old (60-75-years) participants. Study 3 addressed some of the limitations inherent in Study 2, by incorporating information about participants' education level, screening depressed individuals from the sample, and altering the post-stimulus decision task. Study 4 examined whether a Cognitive Interview and a modified Cognitive Interview were also useful with older adults who show signs of cognitive impairment, as measured by the Mini-Mental State Exam (Folstein, Folstein & McHugh, 1975). Although the recall of impaired older adults (75-96-years) was found to be less complete and less accurate than that of non-impaired older adults (75-95-years), the Cognitive Interview and modified Cognitive Interview increased the number of correct Action, Person, Object, and Surrounding details recalled by each group, with no increases in the number of incorrect or confabulated details. The theoretical and practical implications of these findings are discussed.

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Chapter I:

The older eyewitness

In 2001, over 10.8 million people in the United Kingdom (UK) were over pensionable age[1] (i.e., roughly 18.4% of the total population; National Statistics, 2002a, b, c, & d). This number is predicted to rise to 11.9 million by 2011 and to 13.1 million by 2021 (National Statistics, 2002d). In conjunction with this increase it is expected that older adults will encounter crime on a more regular basis (Blakely & Dolan, 2000; Lachs & Pillemer, 1995; Payne, 2002). The fact that many senior citizens are active members of the community makes it increasingly likely that they will witness or be the victim of traffic accidents, robberies, and other types of volume crime (Yarmey, 1996). Indeed, interviews conducted with individuals from 36,500 households across England and Wales as part of the 2003 British Crime Survey indicated that of the 6,972 participants who reported being a victim of burglary or attempted burglary, 1,589 (15.2%) were over the age of 65-years. Similarly, 1,095 (7.8%) of the 14,089 people who reported being the victim of a violent crime[2] were over the age of 65, whereas 17.9% of the victims of vehicle-related theft[3] were over 65. Research also suggests that older individuals are more likely to be the victims of fraud than younger adults (Brogden & Nijhar, 2000; Jenkins, Asif, & Bennett, 2000; Payne, 2002). Furthermore, studies of the neglect and abuse (physical, psychological and sexual) of older adults in the UK report prevalence rates ranging from 5.0% to 27.5% (see Brogden & Nijhar, 2000, for a review), and suggest that abuse and neglect are being reported with ever-increasing frequency (Jenkins et al., 2000). Such findings imply that older adults, although less frequently involved in criminal investigations than younger adults, nevertheless constitute a sizable and important group of witnesses that should not be overlooked by researchers. As will be seen in the first two chapters of this thesis, however, older adults have received minimal attention in the eyewitness literature.

The present thesis is concerned with addressing this limitation. In particular, the thesis reviews the memory retrieval problems encountered by older witnesses and

[1] Where pensionable age is reported as being 65 years for men, and 60 years for women (National Statistics, Summer, 2003).
[2] Defined as offences in which the offender has some physical contact with the victim, e.g. wounding, common assault, robbery, attempted robbery and snatch theft.
[3] Encompasses the theft of a vehicle, theft from a vehicle, and attempted vehicle theft.

seeks to improve the quality and quantity of their recall. Chapter I introduces the phenomenon of the older witness. First, the term "older adult" is defined. Second, existing perceptions of older witnesses are examined. Third, some of the challenges faced by these adults when attempting to remember a witnessed event are outlined. Specifically, age-related changes in memory and the effects that such alterations have on the ability to act as an eyewitness are explored. Finally, proposed theoretical accounts that explain age-related memory changes are discussed.

1.1 – Definition of the Term "Older Adults"

Ideas about what constitutes old age vary considerably across cultures, and may be linked to chronological age, functional performance (e.g., capacity to work), and the occurrence of significant life events such as retirement (Henrard, 1996). Although societal expectations often confuse chronological age with the social and physiological consequences of ageing, the two are not necessarily related (Henrard, 1996). Even within the same person different physical traits, sensory-perceptual facilities, cognitive abilities, and socio-emotional skills do not age along an identical time course (Yarmey, 1996).

Western countries typically use the term "elderly" in a chronological sense to describe any individuals who are over the age of 60- or 65-years (Dein & Huline-Dickens, 1997). Similarly, the United Nations considers adults over the age of 60 to be "aged" (World Health Organisation, 2001). In accordance with these parameters the vast majority of eyewitness studies involving older participants have defined "old" as being over the age of 60- or 65-years (e.g., Coxon & Valentine, 1997; McMahon, 2000; Mello & Fisher, 1996; Yarmey & Kent, 1980), although some have used a slightly lower cut-off age (e.g., 57-years; Searcy, Bartlett, & Memon, 2000). Consistent with prevailing definitions, the research outlined in this thesis considers adults over the age of 60-years to be old.

Research that involves ageing and memory typically compares the performance of younger adults, who are often in their 20s, to that of a single group of older adults, whose ages normally span 60-90-years (e.g., Coxon & Valentine, 1997; McMahon, 2000). Assigning older adults to a single, undifferentiated category is not necessarily appropriate, however, since the rate of cognitive decline in very late life (i.e., "old-old": aged over 75-years) may be faster, slower, or the same as that occurring at the beginning of old age (i.e., "young-old": aged 60-74-years;

Baeckman & Nilsson, 1996; Baeckman, Small, Wahlon, & Larsson, 2000; Nilsson et al., 1997; Korten et al., 1997).

To date, only one published eyewitness recall study (Brimacombe, Jung, Garrioch, & Allison, 2003) and one eyewitness recognition study (Memon, Gabbert, & Hope, 2004) have distinguished between young-old and old-old adults. Brimacombe et al. (2003) asked young (18-30-years), young-old (59-74-years), and old-old (75-88-years) participants to watch a video about a wallet theft. Immediately after the video, participants were questioned about the event using a courtroom-style format (i.e., participants were directly examined and then cross-examined). Direct-examination questions were straightforward and asked in a congenial manner (e.g., "how tall was the thief?"), while cross-examination questions were either leading, or designed to encourage participants to contradict statements made under direct examination. All three age groups were less accurate in responding to cross-examination questions than to direct-examination questions. In addition, old-old adults were less accurate than young-old and young adults. The accuracy of young-old and young participants, however, was not significantly different, and no interaction effects were observed. Memon et al. (2004) conducted an eyewitness recognition study in which participants were divided into young (19.6-years-old), young-old (< 68-years) and old-old (> 69-years) age groups. Participants viewed a video in which a man spoke to a woman. A week later, participants viewed a target absent line-up to identify the man. Significant age differences were found in participants' ability to correctly reject the line-up. Thirteen percent of the young-old group, but 75% of the old-old group, made false choices from the line-up. The findings from both these studies demonstrate that the abilities of young-old and old-old adults differ and suggest that future eyewitness research should separate these two age groups. As Brimacombe et al. (2003) stated, "...it is certainly possible to cast the 'net' too wide and thus lose some appreciation of age-related trends in eyewitness capabilities within the category of older adults" (p. 514). Hence, the present research will consider two distinct subgroups of older adults: "young-old" adults (67-75-years) and "old-old" adults (> 75-years).

1.2 - Perceptions of Older Witnesses

It is reasonable to assume that increases in the number of older adult witnesses and victims in the UK will lead to a concomitant increase in the frequency with which this group is interviewed by police and called to testify in court. Such a trend has already been observed in some American states (e.g., Wisconsin) (DiMotto, 2000). Nevertheless, few researchers have examined the legal community's attitudes towards older witnesses. This issue is important to consider because the manner in which an older witness is perceived could influence the outcome of a case. For example, if a police officer feels that an older witness is not able to provide reliable or thorough testimony it may limit the direction or scope of an investigation. Similarly, age-related stereotypes can affect the degree to which an older witness' testimony is believed by mock-jurors (e.g., Kwong-See, Hoffman, & Wood, 2001; Nunez, McCoy, Clark, & Shaw, 1999). Nunez et al. (1999) asked participants to read a trial summary that described the aggravated assault of a man whose description varied across conditions. The man was portrayed as a adult (aged 31-years), a generic older adult (aged 66-years), a lonely and vulnerable 66-year-old senior citizen, a 66-year-old grandfather, or a distinguished 66-year-old statesman. In the generic adult and older adult conditions, no attempt was made to elicit victim stereotypes. Participants were then asked to determine a verdict for the case. Interestingly, the statesman stereotype resulted in more guilty verdicts than the grandfather, senior citizen, or young adult stereotypes. The generic older adult evoked more guilty verdicts than the vulnerable senior citizen. Such results suggest that in some circumstances, perceptions of older witnesses can influence decision-making behaviour.

In general, ageing has been linked to favourable qualities such as honesty and sincerity (Ryan, Szechtman, & Bodkin, 1992) as well as to negative traits such as a weak memory (Guo, Erber, & Szuchman, 1999; Ryan, 1992). Similar stereotypes have emerged in studies that examine attitudes toward older witnesses. For example, Ross, Dunning, Toglia, and Ceci (1990) asked college students to rate the average 6-, 8-, 21-, and 74-year-old witness on the following credibility measures: Witness honesty; accuracy; susceptibility to misleading or suggestive questions; and the amount of weight that should be given to witnesses' testimony. Although considered to be the most honest of the four age groups, the older witness was perceived to be less accurate and more suggestible than the 21-year-old witness. In addition, participants reported that they would assign less weight to the testimony of an older adult than to a young adult. Perceptions of the older witness' accuracy and suggestibility were similar to those made of the child witnesses. Furthermore, when asked if there is an age at which people become too old to be competent witnesses, 34% of the participants agreed. This age was reported to be 75.3-years-old on average. One limitation of Ross et al.'s (1990) study is that participants were asked to evaluate a hypothetical, rather than an actual, older witness. Judgements were, therefore, based solely on participants' own stereotypes about such witnesses. In reality, however, judgements are influenced by both prior stereotypes and the intrinsic qualities of witness testimony such as witness confidence level.

Brimacombe, Quinton, Nance, and Garrioch (1997) addressed this issue by determining whether evaluations of hypothetical older witnesses (cf., Ross et al., 1990) are consistent with those of *actual* older witnesses. Brimacombe et al. (1997) showed three groups of adults (18-25-years, 30-44-years, & 65-85-years) a short film about a theft. Immediately after, each person testified about the crime by responding to several questions (e.g., "how tall was the thief") while being videotaped. The videotaped interviews were then shown to a sample of undergraduate students who rated witness accuracy, confidence, competence and honesty. Each student was shown the testimony of one randomly selected witness. Consistent with the results of Ross et al. (1990), older witnesses were perceived to be less credible than younger witnesses on all measures except honesty. This demonstrates congruence between participants' evaluations of hypothetical and actual older witnesses. When Brimacombe et al. (1997) analysed the quality of each witness' recall, however, it was found that older individuals provided fewer correct details about the theft than younger witnesses. It is possible, therefore, that credibility evaluations were influenced by the quality of older adults' testimonies rather than by stereotypes about older adults. To determine whether this was the case, testimonies rated as having low-, moderate-, and high- credibility were selected from young and older adult witnesses, and then transcribed and read by a new sample of participants. A specific group of participants read an older adult's testimony believing that it had been provided by a younger adult and vice versa (i.e., the ostensible age of the witness was manipulated). Other participants read testimonies in which the true age of the witness was provided. Participants were then asked to rate the testimonies on the basis of overall credibility. No significant effects of ostensible age were observed, leading Brimacombe et al. (1997) to argue that mock-jurors' evaluations of an older witness were based on the intrinsic quality of older adults' testimony, rather than on negative stereotypes about older adults. This conclusion, however, overlooks the equally likely possibility that stereotypes and testimony quality operate in conjunction.

A serious limitation of the above literature is that it concentrates solely on mock-jurors' perceptions of older witnesses. Few published studies have examined police officers' perceptions of such witnesses, despite the fact that the police are usually the first point of contact in the criminal justice system, and are the driving force of an investigation (although see Yarmey, 1984; Yarmey & Jones, 1982).

1.3 – Capacity of Older Adults to Act as Witnesses

As demonstrated in the preceding section older witnesses are generally believed to be less accurate, less credible and less competent than younger witnesses (cf., Ross et al., 1990). The research reviewed in the present section examines whether such perceptions are substantiated by older adults' actual eyewitness performance. Forms of age-related memory decline that are most relevant in an eyewitness situation, such as recognition, recall, and source memory will be examined.

Recognition occurs when an individual is presented with a stimulus and must determine whether it has been experienced earlier (Parkin, 1991). Typically, this involves the deliberate act of recollecting an event that is stored in long-term memory (Eysenck & Keane, 1997). In a typical paradigm to assess eyewitness recognition memory, participants watch a simulated event (e.g., a video) and are later asked to identify target individuals from a post-event line-up. Most research of this kind reveals that older (> 60-years) and younger (17-35-years) adults are equally able to correctly identify a suspect from line-ups in which the suspect is present. When the suspect is absent from line-ups, however, older witnesses tend to make more false identifications (Memon & Bartlett, 2002; Searcy, Bartlett, Memon, & Swanson, 2001; Yarmey, 1996; Yarmey et al., 1984). Such results suggest that recognition performance deteriorates with age. Interestingly, however, if a to-be-remembered target is an older adult, older witnesses can perform as well as, or better than, young witnesses (List, 1986; Wright & Stroud, 2002).

Recall involves remembering previously experienced information (e.g., a word, an event), either with (i.e., cued recall) or without (i.e., free recall) the help of specific memory prompts (e.g., providing the first letter of a to-be-remembered word; Parkin, 1991). Overall, research has shown that recall declines with advancing age. Nyberg, Baeckman, Erngrund, Olofsson, and Nilsson (1996) demonstrated that age predicted participants' (35-80-years) abilities to recall heard or enacted sentences (e.g., roll the ball). Older adults also perform worse than younger adults on tasks that involve the recall of prose (Carlesimo et al., 1998), or word lists (Burke & MacKay, 1997; Jacobs, Rakitin, Zubin, Ventura, & Stern, 2001). These declines are not simply due to the fact that older adults are less motivated to remember unfamiliar laboratory stimuli that have little personal relevance (Burke & MacKay, 1997). Rather, age differences persist in naturalistic memory tasks such as remembering people's names (James, 1997), remembering the position of groceries on a shelf (Read, 1987), and remembering verbal and written information about medical prescriptions (Morrell, Park, & Poon, 1990). In general, the effects of increasing age on recall are greater than those observed in recognition tasks (Balota, Dolan, & Duchek, 2000; Parkin, 1996).

Although only a handful of studies have compared young and older adults' recall in an eyewitness context, the results of this research mirror the findings from conventional memory tests (e.g., recalling a word list). In general, older adults' eyewitness recall is less complete and less accurate than their younger counterparts (Yarmey, 2000). The earliest published study to examine the recall of older witnesses was conducted by Yarmey and Kent (1980). Younger (15-26-years) and older (65-90-years) participants viewed 23 slides depicting the assault and robbery of a young couple by a young male assailant. Participants then answered 40 multiple-choice questions about the event. Young participants answered more questions correctly (accuracy = 81%) than older adults (accuracy = 71%). When recall was further categorized into specific detail types, older adults were less accurate than young adults at recalling details about people (accuracy = 71% vs. 81%, respectively), victims (77% vs. 87%), the assailant (69% vs. 80%), and non-person items (65% vs. 76%).

Older adults also perform poorer than young adults when the to-be-remembered stimulus and the method of assessing memory are more ecologically valid. List (1986) showed three groups of participants (aged 10-years, 20-years, and 65- to 70-years) separate videos about either a college-aged or middle-aged female shoplifter. One week later participants were asked to recall the shoplifter's appearance, the objects shoplifted and the shoplifter's actions during the scene. Overall, children and older adults recalled fewer details than younger adults, with older adults' recall being less accurate than that of the other two groups. Similarly, Brimacombe et al. (1997) showed participants a two-minute video depicting a young woman stealing a wallet and immediately interviewed them about this event. Participants were initially asked a series of 14 open- and closed-ended questions (e.g., "how tall was the thief?") by one experimenter. A second experimenter then asked 10 questions resembling those asked in cross-examination (e.g., "you claimed that you saw a purse stolen, is that correct?"). As in previous studies, older adults (65-85-years) were less accurate than young adults (18-25-years) or middle-aged adults (30-44-years) when questioned by either experimenter. Specifically, older adults had a 78% accuracy rate when questioned by the first experimenter, but only a 48% accuracy rate when questioned by the second. Young adults, on the other hand, achieved accuracy rates of 94% and 66%, respectively, and middle-aged adults achieved rates of 94% and 67%, respectively. Yarmey (1993) used a more realistic to-be-remembered event to assess older and younger witnesses' memories. In this study, a female target approached older (45-65-years), middle-aged (30-44-years), and young (18-29-years) adults in a public place and engaged them in conversation. Older adults were less able to answer questions about the target (e.g., age, height, weight, eye colour, complexion, hair colour, hair length and style) than young or middle-aged adults. Furthermore, when the target's characteristics were classified as being primary (age, height, hair colour and hair length) or secondary (hair style, eye colour, weight and complexion) by a separate set of judges, young adults were superior at recalling both primary and secondary characteristics.

As the above studies indicate, older witnesses tend to be less accurate and recall fewer details than younger witnesses, regardless of the stimulus format (slide show, Yarmey & Kent, 1980; video, List, 1986; or live physical encounter, Yarmey, 1993), the methods used to test recall (written free recall, List, 1986; cued recall, Yarmey, 1993, or interview, Brimacombe et al., 1997), and the retention interval between stimulus presentation and questioning (no interval, Brimacombe et al., 1997; minutes, Yarmey, 1993; a week, List, 1986). It is also interesting to note that this trend remains stable regardless of whether participants were initially warned that they would be asked to remember the event (Yarmey & Kent, 1980), or whether they received no such warning (Yarmey, 1993; Brimacombe et al., 1997).

Research also suggests that older adults are worse than younger adults at identifying the source of their memories, such as determining whether they witnessed an event themselves or whether they simply heard about it elsewhere (e.g., friend, television; Johnson, Hashtroudi, & Lindsay, 1993). A 46-study meta-analysis conducted by Spencer and Raz (1995) revealed that with advancing age, memories for the context in which an event occurred are forgotten faster than memories for the event itself (see also Hashtroudi, Johnson, & Chrosniak; 1989; Schacter, Kaszniak, Kihlstrom, & Valdiserri, 1991; Johnson et al., 1993). It has also been shown that older adults have difficulty discriminating between two sources of information that are alike. Ferguson, Hashtroudi, and Johnson (1992) asked older (65-75-years) and younger (18-23-years) participants to listen to a list of words read by two different speakers. Immediately after presentation of the list, participants were asked to decide which speaker had said certain words. Overall, older adults were poorer than younger adults at source discrimination when the speakers were perceptually similar (e.g., of the same gender).

Age-related source memory deficits have also been demonstrated in an eyewitness context. For example, Mitchell, Johnson, and Mather (2003) found that when 76-year-old and 19-year-old participants were asked to watch a video depicting a burglary, answer questions about the video (some of which contained misleading information), and then identify the source of certain details (video, or post-video questions), the older adults were more likely to mistakenly attribute misleading details to the video. As Burke and MacKay (1997) noted, source misattribution errors can have serious implications for eyewitness testimony. In addition to making it difficult for an older witness to distinguish between information witnessed during the event from post-event information, source memory deficits may also hinder an older witness' ability to remember certain details about the event itself, such as which assailant uttered a threat.

Taken together, the above research demonstrates that older adults are generally less efficient than younger adults at performing eyewitness tasks. In the next section some of the possible reasons for this age-related decline will be considered.

1.4 – Explaining Age-Related Memory Deficits

Several factors operating additively or independently may be responsible for older adults' diminished capacity to perform eyewitness memory tasks. First, age-related declines in sensory ability may make information about a to-be-remembered event less likely to be encoded in memory (e.g., Yarmey, 2000). Second, age-related changes in cognitive function may make it more difficult for older adults to retrieve details that have previously been encoded (e.g., Anderson, 1999; Salthouse, 1996a). Third, variations in older and younger adults' schemas and expectations may mean that these groups encode, store and retrieve information differently (e.g., Maentylae & Baeckman, 1992). Finally, negative social stereotypes about ageing may influence (e.g., via the stress they add) the extent to which memory declines with advancing age (e.g., Hess, Auman, Colcombe, & Rahhal, 2003). The present section will examine each of these factors in turn.

1.4.1 – Deteriorating Sensory Abilities

The quality and quantity of material an individual encodes may be limited by external factors that are specific to the circumstances of an event (Brown & Craik, 2000). For example, numerous researchers (e.g., Hockley, Hemsworth, & Consoli, 1999; O'Rourke, Penrod, Cutler, & Stuve, 1989) have reported that the ability to recall details about an alleged suspect is poor when the suspect is: Located far from the witness; visible for only a short time; wearing a disguise; or seen under low lighting conditions (see Wells & Olson, 2002, for a review). Accurate encoding may be particularly difficult for older witnesses, who often experience degenerative changes in their vision and hearing. Age-related alterations in the structure and physiology of the ear can result in a reduced ability to hear high frequency sounds (Scholtz et al., 2001), to locate the source of a sound in space (Schneider & Pichora-Fuller, 2000), and difficulties in understanding speech, especially when there is background noise or when poor acoustics create sound distortion (Gordon-Salant & Fitzgibbons, 1995; Mazelova, Popelar, & Syka, 2003). Similarly, age-related changes in the structure of the eye can cause a loss of visual acuity (Jackson, Owsley, & McGwin, 1999) especially in the periphery of the visual field or when the perceived object is moving (Wist, Schrauf, & Ehrenstein, 2000). Night vision (Fozard et al., 1977) and colour discrimination (Haegerstrom-Portnoy, Schneck, & Brabyn, 1999) may also deteriorate with advancing age. Furthermore, older adults are prone to specific pathologies of the eye that can obscure vision such as cataracts (Schneider & Pichora-Fuller, 2000). Being less able to see and hear the world around them, older adults may be less able to attend to the finer details of a witnessed event.

1.4.2 – Age-related Changes in Cognitive Function

All witnesses, regardless of age, can have difficulties retrieving information even if it has been stored in memory. This may be because inappropriate retrieval cues have been used or because retrieval cues have not been adequately specified, thereby leading to competition between the target memory and related memory traces (MacLeod, 2002). In addition, however, older witnesses must contend with the fact that advancing age is often accompanied by a decline in retrieval ability. Several theories have been proposed to account for this phenomenon. One such theory, the Speed of Processing approach, maintains that advancing age is accompanied by an overall slowing of cognitive processes (e.g., Salthouse, 1985). According to this view, age differences in memory do not reflect changes in memory functioning itself, but rather differences in the speed with which cognitive operations are executed (Salthouse, 1996a). In support of this theory, Salthouse (1996a) reviewed an extensive body of literature that suggested that age-related influences are consistently found on diverse measures of processing speed. Salthouse also demonstrated that when processing speed is statistically controlled, age is only weakly related to memory performance (i.e., the effects of age on memory are mediated by processing speed; see also Bryan & Luszcz, 1996; Salthouse, 1996b; Park et al., 1996). Nevertheless, it has been argued that the Speed of Processing perspective fails to explain the mechanisms (e.g., neurophysiological) of cognitive slowing (Salthouse, 1996b) and does not account for the fact that age-related deficits are more severe for episodic memory than for semantic memory (Bolata et al., 2000). Models of processing speed have also been criticised on the grounds that they are primarily based on cross-sectional studies (cf. Park et al., 1996; Salthouse, 1996a) in which different age groups are compared, rather than longitudinal studies in which a single age cohort is tested at several points in time (Hertzog, Dixon, Hultsch, & MacDonald, 2003). Cross-sectional studies cannot account for individual differences in processing speed or for individual age-related changes in processing speed, both of which are important determinants of memory performance (Hertzog et al., 2003). Indeed, Sliwinski and Buschke (1999) found that although 75% of the cross-sectional age differences in a composite memory score derived from cued recall, free recall and sentence span tasks were mediated by processing speed, only 10% of the longitudinal age differences in memory were mediated by processing speed (see also Hertzog et al., 2003). This finding suggests that support for the Speed of Processing hypothesis is dependent on the methodological circumstances under which it is tested.

A second processing approach, which considers the role of attentional resources, holds that only a limited pool of resources is available to cope with cognitive tasks at any given time (e.g., Hashtroudi, Johnson, & Chrosniak, 1990; Kahneman, 1973). Specifically, this theory proposes that older adults have fewer processing resources at their disposal than younger adults. In turn, this makes it difficult for older adults to engage in cognitively demanding tasks such as elaborate encoding strategies that facilitate subsequent memory retrieval. In support of this theory, older adults are more likely than younger adults to encode information generally, rather than focusing on specific contextual details (Hashtroudi et al., 1990). Evidence also stems from research in which participants performed a divided attention task (e.g., recalling a list of words while performing a visual reaction time task using manual responses). Compared to younger adults, older adults' memories are less complete and accurate when attention is divided, thereby indicating that older adults possess a limited set of processing resources (Anderson, 1999; Park, Smith, Dudley, & Lafronza, 1989).

Craik and colleagues (Craik, 1986, 1994; Craik & Jennings, 1992) suggested that age-related reductions in attentional capacity make older adults less able to engage in self-initiated remembering processes such as retrieval searches. Instead, they proposed that the memory performance of older adults is greatly influenced by the amount of retrieval support available from the environment (environmental support hypothesis). According to this framework, when more contextual cues are present in the environment, attentional capacity deficits will be reduced because the environmental cues can facilitate memory performance (Hasher, Tonev, Lustig, & Zacks, 2001). The observation that age differences in memory are typically found on tasks in which environmental support is low (e.g., free-recall tasks), but are less pronounced in tasks with moderate (e.g., cued-recall) or high support (e.g., recognition), substantiates this account. In recognition tests, individuals are presented with items that were previously encountered during encoding (i.e., to-be-remembered items were physically present at encoding and retrieval) which reduces the need for self-initiated processing. In free recall, however, encoding details are absent during retrieval hence individuals must generate the memories without support (Sharps, 1998).

The attentional capacity theory of age-related memory decline is almost indistinguishable from the theory that older adults' memory deficits are the result of a reduced working memory capacity (Balota et al., 2000; Salthouse, Mitchell, Skovronek, & Babcock, 1989). Indeed, Park et al. (1996) operationalised working memory capacity as "the amount of cognitive resources available to store new information and at the same time perform mental operations on either incoming or recently accessed information" (p.621), which is analogous to definitions of attentional capacity. As with the attentional capacity theory, the reduced working memory capacity account maintains that older adults have a limited pool of resources with which to perform cognitive tasks. As task complexity increases, older adults' cognitive performance suffers. The main distinction between the two theories is that the former is vague in its description of the limited resource pool, whereas the latter maintains that this pool is actually working memory (Anderson & Craik, 2000; Park & Hedden, 2001; Park et al., 1996). The reduced working memory capacity account is supported by the observation that working memory capacity, which has been shown to decline with age (Salthouse, 1991), mediates performance on many cognitive tasks such as speech comprehension (Stine & Wingfield, 1987), recognition (Morrell & Park, 1993), and memory for text (Hultsch, Hertzog, & Dixon, 1990). Nevertheless, both theories have been criticized on the grounds that they fail to clearly specify and define all their central constructs (Balota et al., 2000).

An additional theory that is used to explain age-related memory deterioration is the reduced cognitive control approach (e.g., Park & Hedden, 2001), which posits that decrements in *both* processing efficiency and working memory capacity are responsible for memory deficits among older adults. Park et al. (1996) measured the perceptual speed of 20-90-year-old participants using the Digit Symbol subscale from the Wechsler Adult Intelligence Scale-Revised (Wechsler, 1981), a timed letter comparison task (i.e., compare letter strings and decide whether these were the same or different), and a timed pattern comparison task (i.e., compare geometric figures and decide wither these were the same or different). Participants were also asked to complete tasks that assessed free-, cued-, and spatial recall. The spatial recall task was the least cognitively demanding, followed by the cued recall task, which was less demanding than the free recall task. Processing speed and resource capacity both explained the age-related variance in free- and cued-recall. Conversely, the variance of spatial recall was explained by processing speed alone. This suggests that processing speed is a central component of age-related memory decline (cf. Salthouse, 1996a), and shows that it operates in conjunction with working memory capacity when cognitive tasks are complex.

The inhibitory deficit view (Hasher & Zacks, 1988) states that excitatory mechanisms are necessary to activate relevant memory representations while inhibitory mechanisms are necessary to suppress irrelevant information. According to this account, age-related memory declines occur because the inhibitory mechanisms of older adults are less efficient than those of younger adults (Anderson & Craik, 2000). Hasher, Zacks, and May (1999) specified three inhibitory functions that decline with age: The access function which impairs the initial access of irrelevant information from memory; the deletion function which discards unnecessary information from memory; and the restraint function which prevents strong but potentially inaccurate memories from being reported. To test this theory, Hasher, Quig, and May (1997) asked younger (17-22-years) and older (60-79-years) participants to generate the last word in a series of sentences (e.g., "stamp" for: "he mailed the letter without a ____"). For certain sentences, the generated word was either confirmed (i.e., it was provided to complete the sentence), or disconfirmed (i.e., an unexpected word was provided to complete the sentence). Participants were asked to remember the word that appeared to complete the sentence regardless of whether it confirmed their own personal prediction. When subsequently asked to recall the experimenter-provided words, young adults were able to exclude irrelevant information (i.e., self-generated words) whereas older adults reported both experimenter-provided and self-generated words equally (see also Connelly, Hasher, & Zacks, 1991).

Another theory proposed to account for age-related memory decline is the associate deficit hypothesis (Naveh-Benjamin, 2000). This account is based on the view that complex to-be-remembered events are composed of many different kinds of information linked together in meaningful ways. Events are defined (and thereby remembered) not just by the specific characteristics of the items and actors involved, but also by the time and place at which they occurred and the internal cognitive state of the observer. The associate deficit hypothesis asserts that older adults have poorer memories because they are less proficient at forming new connections between the to-be-remembered elements of an event. To test this theory, Naveh-Benjamin (2000) presented older (72-years) and younger (22-years) adults with pairs of unrelated items. Pairs consisted of either a word and a non-word (Experiment 1) or two words (Experiment 2). Memory for the association between two items was examined by presenting participants with pairs of items from the initial study phase that were either intact (i.e., items appeared in the same pairs as at study) or recombined (i.e., items appeared in different pairs from the study phase). Participants were then asked to recognise intact pairs. As predicted by the associate deficit hypothesis, older adults were significantly poorer then young adults at remembering associative information (also see Naveh-Benjamin, Hussain, Guez, & Bar-On, 2003).

Finally, age-related declines in memory have been attributed to reductions in neural tissue volume, blood flow, and metabolic processes (e.g., Prull, Gabrieli, & Bunge, 2000; Raz, 2000). Much of this research demonstrates that age-related changes to brain structures and functions follow an anterior-posterior gradient, with changes in brain volume, metabolism and blood flow being greatest in the frontal lobes, smaller in the temporal lobes, and smaller still in the parietal and occipital cortices (Anderson & Craik, 2000; Madden & Hoffman, 1997). Given that the frontal lobes, temporal lobes, and hippocampus have been implicated in recall and recognition it is assumed that deterioration of these structures is accompanied by declines in memory (Anderson & Craik, 2000). Indeed, several researchers report that memory performance in older adults is positively correlated with hippocampal volume (Raz, Gunning-Dixon, Head, Dupuis, & Acker, 1998; Simic, Kostovic, Winblad, & Bogdanovic, 1997) and frontal lobe functioning (Fabiani & Friedman, 1997). Despite such evidence, however, the anterior-posterior gradient approach is sometimes criticised for ignoring the effects of ageing on the brain's neurochemical pathways. It has been shown, for example, that cholinergic and dopaminergic systems both contribute to memory processes and both undergo age-related deterioration (DeKosky & Palmer, 1994).

None of the theories mentioned in this section offer a definitive account of age-related memory changes. Nevertheless, experimental support has been demonstrated for each theory. It is also interesting to note that many of these theories overlap. For example, similar constructs appear in both the attentional capacity and reduced working memory capacity theories. Similarly, the reduced cognitive control theory incorporates elements of both the Speed of Processing hypothesis and the reduced working memory capacity theory. This correspondence suggests that theoretical interpretations of age-related memory decline may operate in conjunction.

1.4.3 – Schemas and Expectations

In addition to age-related changes in cognitive function, differences in older and younger adults' expectations may contribute to differences in their performance on eyewitness memory tasks. Only certain details can be encoded at any given time because it is difficult to simultaneously attend to all the information in the environment. These details are selected and filtered out according to individual interests, general knowledge, and personality (Brown & Craik, 2000). Davies, Kurvink, Mitchell, and Robertson (1996), for example, found that witnesses are more likely to attend to the finer details of an object if it is familiar (e.g., a mechanic may be better able to describe a robber's car than someone who has no knowledge of cars). Personal expectations and prior knowledge also help organize storage and retrieval of event details (Schank & Abelson, 1977). Witnesses may fail to describe an important feature of a particular action, object or person, simply because they do not realize its importance (Fisher & Geiselman, 1992). For example, if a witness does not realize that gun handles are made in various shapes, she or he may not describe the handle of a robber's gun, even though she or he remembers what it looks like (Fisher & Geiselman, 1992).

Several studies have demonstrated that young and old adults do not always perceive the same event in the same way, and have suggested that such discrepancies can result in differential abilities to encode and remember the event (e.g., Maentylae & Baeckman, 1992; Yarmey, 1993; Yarmey, Jones, & Rashid, 1984). Yarmey et al. (1984) asked older (65-84-years) and younger (18-36-years) participants to watch 60 slides depicting the rape of a young woman. Participants were shown scenarios in which the woman was rated as being 'provocative' or 'unprovocative', 'resisting' or 'unresisting', and the assailant was rated as being 'unpleasant' or 'pleasant' looking. After completing a short filler task, participants were asked to remember as many details about the event as possible using free recall followed by a 30-item multiple-choice questionnaire. Finally, participants completed a questionnaire about their attitudes towards rape. The amount of information recalled about the assault was influenced by age. Overall, older adults remembered fewer details than younger adults. Within each age group, however, older adults remembered more information when the victim resisted her attacker than when she did not. Younger adults remembered more information when the victim did not resist. Similarly, younger participants remembered more details when the assailant was pleasant than when he was unpleasant-looking, while the reverse was found for older participants. These observations were consistent with reported attitudes towards rape – young adults were more sympathetic to rape victims and were less likely to accept rape myths than older adults (Yarmey et al., 1984). Such results indicate that perceptions of sexual assault differ according to age and that these perceptions can influence recall performance.

Similarly, it has been shown that older adults are generally poorer at remembering younger adults than they are at remembering people from their own age group (List, 1986; Wright & Stroud, 2002). For example, List (1986) showed three groups of participants (10-years, 20-years, and 65- to 70-years) separate videos about a college-aged and middle-aged female shoplifter. One week later, participants were asked to describe the shoplifter and her actions. Older participants recalled less about the college-aged target than did younger participants, although older adults were as proficient as both groups of young adults at remembering a middle-aged target. Older participants' improved attention and memory for the older target was attributed to their increased familiarity with people from this age group (List, 1986).

Older and younger participants also process schema-consistent and schema-inconsistent events differently. For example, when younger (19-31-years) and older (65-85-years) adults were asked to observe objects that were normally (e.g., computer) and not normally (e.g., kitchen appliance) found in an office, younger adults were more likely to recall schema-inconsistent than schema-consistent objects. No such differences were found for older adults (Maentylae & Baeckman, 1992).

In addition, older adults often place more importance on their personal values and goals than younger people (e.g., Labouvie-Vief, 1982). This can cause older adults to rely more on their personal experiences and feelings when interpreting and subsequently remembering information (Hashtroudi, Johnson, Vnek, & Ferguson, 1994). Indeed, when asked to recall stories, young participants' memories are literal whereas those of older adults contain numerous inferences, interpretations, and comments about their own cognitive activities (e.g., "I remember X because I thought..."), and comments about the moral implications of a story (Adams, Labouvie-Vief, Hobart, & Dorosz, 1990; Adams, 1991). Hashtroudi and colleagues (Hashtroudi et al. 1990; Hashtroudi et al., 1994) noted that focusing on thoughts and feelings in this way hampers source monitoring and reduces recall accuracy, especially among older adults.

1.4.4 – Negative Stereotypes about Ageing

Social factors also have a role in determining the extent to which memory performance is influenced by advancing age (e.g., Cartensen & Turk-Charles, 1994; Hess et al., 2003). Negative stereotypes about a group's performance on a cognitive task may cause its members to experience more anxiety or less motivation when they encounter this task. Consequently, their performance on the task may suffer and confirm stereotyped expectations. The threat posed by negative stereotypes is greatest for individuals who strongly identify with their group and for those who value the stereotyped trait (Steele, 1997; Steele & Aronson, 1995).

Hess et al. (2003) determined whether negative stereotypes about older adults' memory (e.g., ageing is detrimental for memory; Ross et al., 1990) influenced their performance on memory tests. Young (18-30-years) and older (62-84-years) participants were asked to read research findings that either supported or disconfirmed negative stereotypes about ageing and memory. A control group was given no information about the effects of ageing on memory. Participants were then asked to recall a list of words and to complete a questionnaire that measured how much they valued their memory ability. Young adults' performance on the recall task did not vary across conditions, although older adults' performance was shown to be a function of stereotype condition and the degree to which they valued their memory. Specifically, when older adults placed more value on their memory and were exposed to negative age-memory stereotypes, their recall performance suffered. Interestingly, older adults' recall in the control condition was comparable to the negative-stereotype condition, such that participants' recall was negatively correlated with the level of value they assigned to their memories. This demonstrates that the harmful effects of negative stereotypes on older adults' memory may occur even when such stereotypes are not intentionally introduced.

1.5 – Memory Disorders and Older Adults

In addition to deteriorating sensory function, non-pathological cognitive changes, schema differences, and social stereotypes, many older adults must contend with the extra complications introduced by degenerative memory disorders. One of the most common memory disorders among older adults is dementia, which is defined by the American Psychiatric Association's (1994) *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) as a syndrome that consists of memory impairment and at least one of the following cognitive deficits: Aphasia; apraxia; agnosia; or disturbance in executive abilities. Impairment must be sufficient to interfere with social or occupational functioning, and must be experienced in the absence of delirium or major non-organic psychiatric disorders.

In the United Kingdom, approximately 1 in 50 people between 65- and 70-years, 1 in 20 people between 70- and 80-years, and 1 in 5 people over the age of 80-years have been diagnosed with some form of dementia (Alzheimer's Society UK, 2000). It is estimated that 55% of these individuals have dementia of the Alzheimer's type, 20% have vascular dementias, 15% have dementia with Lewy bodies, 5% have Fronto-temporal dementia (e.g., semantic dementia), and a further have 5% other forms of dementia (Alzheimer's Society UK, 2000).

Each type of dementia affects the brain in a different way and is, therefore, associated with a different pattern of cognitive impairment. Dementias caused by sub-cortical pathologies (e.g., Huntington's & Parkinson's diseases) are often characterized by declines in recall, but not recognition (Libon et al., 1997; although see Lang, Majer, Balan, & Rieshies, 2000). Vascular dementia, on the other hand, occurs when neurons die as the result of oxygen deprivation (e.g., because of a blockage in the brain's vascular system). Since vascular problems can affect certain regions of the brain and leave other parts unaffected, individuals retain specific functions (e.g., sensation and reflexes) and lose others (e.g., speech) (Strub, 2003).

Of the different types of dementia, the effects of Alzheimer's disease on cognition have been the most widely researched (Baeckman et al., 2000). Although the exact causes of Alzheimer's disease are currently unknown, traumatic brain injury (Jellinger, Paulus, Wrocklage, & Litvan, 2001), high blood pressure (Skoog, 1997), and genetic inheritance (Rubeinsztein, 1997) have been implicated in its onset. The pathological changes associated with Alzheimer's disease such as synapse loss and neuronal atrophy (Eikelenboom, Hoogendijk, Jonker, & van Tilburg, 2002) typically originate in the trans-entorhinal region of the brain and spread to the hippocampus, the inferior temporal lobe, and the frontal lobes. Eventually the entire cortex, with the exception of the primary motor and sensory cortices, is affected (Braak & Braak, 1991).

As Alzheimer's disease progresses the ability to reason and think abstractly deteriorates. Language disorders such as impaired word naming and comprehension become more prominent; and anosognosia (wherein the individual has no insight into the disorder) occurs (Helmes & Ostbye, 2002). Most notably, however, Alzheimer's disease is associated with memory loss (Hodges, 2000). Specifically, those with Alzheimer's disease are worse than matched controls at story recall (Hodges & Patterson, 1995; Locascio, Growdon, & Corkin, 1995), face and word recognition (Hodges & Patterson, 1995), and autobiographical memory recall (Greene, Hodges, & Baddeley, 1995). Individuals with Alzheimer's disease also become progressively impaired on semantic memory tasks such as word definition, picture naming (Astell & Harley, 2002; Hodges et al., 1996), and in determining the associations between objects (Hodges & Patterson, 1997).

Although dementia is a common cause of cognitive impairment among older adults, it is not the only cause. Schizophrenia (Harvey et al., 2002), depression (e.g., Veiel, 1997), physical illness (e.g., bradycardia; Barbe et al., 2002), and some medications (Schaeufele, Bickel, & Weyerer, 2002) have also been implicated. Furthermore, surgery (Ancelin et al., 2001) and insomnia (Cricco, Simonshick, & Foley, 2001) have been shown to result in the temporary cognitive decline of older adults. Zunzunegui, Alvarado, Del-Ser, and Otero (2003) argued that extensive social networks may protect against cognitive decline, and proposed that cognitive impairments are not caused entirely by physical factors. Although social factors may indeed play a role in cognitive decline such claims should be viewed with caution, since poor social integration may be a product, rather than a cause, of impairment (Rankin, Kramer, Mychack, & Miller, 2003).

Research has demonstrated that older adults with cognitive impairments are particularly susceptible to abuse and neglect (Coyne, 2001; Lachs, Williams, O'Brien, Hurst, & Horwitz, 1997). Indeed, the prevalence of abuse among older adults with dementia is estimated to exceed that cited for all older adults (Coyne, 2001). Moreover, a survey conducted by Pillemer and Suitor (1992) found that approximately 20% of a sample of 236 primary caregivers feared becoming violent towards a patient with dementia. The excessive physical, social and psychological demands of caring, coupled with impaired older adults' inabilities to advocate their needs, are believed to contribute to abuse (Coyne, 2001). Individuals with cognitive impairment may also be the only witnesses to crimes against others such as fellow group home residents (Milne & Bull, 2001), or may live in socially disadvantaged areas with high crime rates (Kebbell & Hatton, 1999). To date, however, no published research has examined the eyewitness performance of older adults with cognitive impairments.

1.6 – Chapter Summary

The present chapter highlighted several issues of consequence. Most importantly, it demonstrated that a substantial number of older adults in the UK have been, or are likely to be, exposed to crime. This signifies that the study of older adult witnesses is beneficial. Moreover, the present chapter explored mock jurors' beliefs about older witnesses. Overall, research has concluded that age-related stereotypes exist and can influence mock-jurors' decision-making behaviours. From this review, however, it is apparent that little information exists about police officers' perceptions of older witnesses. Next, beliefs about older witnesses' memory performance were compared to this age group's *actual* performance. In particular, it was shown that advancing age is generally accompanied by a decline in recognition-, recall-, and source-memory. Explanations for this deterioration, such as age-related changes in sensory function, cognition, schemas and the effects of social stereotypes, were examined. Finally, this chapter considered the challenges faced by older witnesses with cognitive impairments and it was noted that little research has been conducted with this group.

Although older adults are typically less accurate and less thorough than young adults when recalling a witnessed incident, efforts to enhance older adults' recall are sparse, as will be seen in the next chapter. Also in Chapter II, one of the most widely tested methods of for enhancing witness recall (the Cognitive Interview; Fisher & Geiselman, 1992) will be described and its use with older witnesses evaluated.

Chapter II:

Improving the older eyewitness' recall

In this chapter interviewing techniques that have been developed to improve witnesses' recall for an event will be evaluated, with particular emphasis being placed on the Cognitive Interview (CI). The theories upon which the CI is based will be described and related to the CI protocol. Next, empirical support for this technique and criticisms concerning it will be examined. Finally, the use of the CI to improve older witnesses' recall will be considered.

2.1 – Techniques for Enhancing Witness Recall

Although recent research has attempted to enhance recall performance by training participants to improve their encoding skills prior to observing an event (e.g., Py & Ginet, 2001), such techniques are impractical and of limited use in most situations. Instead, it is generally recognized that efforts to improve recall should be aimed at the retrieval stage (Chandler & Fisher, 1996). Researchers have focused on techniques such as hypnosis, narrative elaboration, the National Institute of Child Health and Human Development (NICHD) Interview, the Step-wise Interview, conversation management, and the Cognitive Interview. The strengths and limitations of each of these methods will be described in turn.

2.1.1 - Hypnosis

Anecdotal evidence suggests that information elicited from hypnosis has resolved many difficult cases (Smith, 1983). The results of controlled laboratory (Erdelyi, 1994) and field (Dinges et al., 1992) studies, however, are disparate. Some have shown that hypnotized participants recall more correct information than non-hypnotized controls, while others have demonstrated that hypnosis results in more incorrect responses and heightened suggestibility (Dywan & Bowers, 1983; Kebbell & Wagstaff, 1997). According to Fisher (1995), the findings from such studies are so diverse that hypnosis should not be considered a reliable technique (see Wagstaff, 1999; Kebbell & Wagstaff, 1998, for reviews).

2.1.2 – Narrative Elaboration

The narrative elaboration interview was designed to help child interviewees overcome developmental limitations in communication and memory (Saywitz & Snyder, 1996; Saywitz, Snyder, & Lamphear, 1996). Prior to an interview, children receive training about the level and types of details required by investigators (Bowen & Howie, 2002). Children are also taught to use pictorial cue cards to trigger the retrieval of relevant information (e.g., people involved in the incident, the setting, actions; Brown & Pipe, 2003a). In the actual interview, free recall of an event is followed by the presentation of these cards (each card is accompanied by the question, "Does this card remind you to tell anything more?" Camparo, Wagner, & Saywitz, 2001, p.64). Narrative elaboration elicits more correct recall than control interviews with no concomitant increases in errors (Brown & Pipe, 2003a & b; Saywitz & Snyder, 1996; Saywitz et al., 1996), although this paradigm is untested with adults.

2.1.3 - NICHD Interview

The NICHD Interview was developed at the U.S. National Institute of Child Health and Human Development for use with children who allege sexual abuse. Interviewers introduce themselves then instruct the witness to be truthful and admit when she or he does not know the answer to a question. To establish rapport and to give the child practice in answering questions, interviewers also request that a neutral event (e.g., day at school) be described. A free recall account of the alleged abuse is then sought and is followed by a series of open-ended questions. Finally, probing questions (i.e., closed questions, yes / no questions) are asked to clarify the child's account (Orbach et al., 2000).

Sternberg et al. (1997) compared a NICHD Interview in which interviewers followed a partially scripted protocol to a control interview, and found that more details were elicited with the NICHD Interview. A fully scripted interview, however, did not result in more information than a control interview (Sternberg, Lamb, Orbach, Esplin, & Mitchell, 2001). Evidence to support the value of this technique is therefore mixed. In addition, since all evaluations of the NICHD Interview have been conducted in the field it is difficult to assess the accuracy of reported details (Orbach et al., 2000). This technique has also not been tested with adults.

2.1.4 - Step-wise Interview

The Step-wise Interview (Marxsen, Yuille, & Nisbet, 1995; Yuille, Hunter, Joffe, & Zaparniuk, 1993) has been used extensively by police and social workers in North America (Poole & White, 1998). In a Step-wise Interview, the interviewee is first encouraged to describe two neutral experiences, and told about discuss the need to be truthful (Poole & White, 1998). Next, a free recall account of the witnessed event is sought and interviewers ask open-ended, then specific questions about the details recalled. Next, interviewers may use a number of memory-jogging techniques depending on whether these are deemed appropriate to the case. Cognitive Interview mnemonics can be employed as long as it is emphasized that the interviewee's initial recall attempt was not questionable or lacking in any way (Yuille et al., 1993). Few empirical studies have tested the Step-wise Interview (see Yuille et al., 1993), and as a result, little information exists about the nature of interviewees' recall with this technique (e.g., accuracy, level of detail provided).

2.1.5 - Conversation Management

Conversation management (CM) seeks to facilitate the use of interpersonal and analytical skills during an interview (Milne & Bull, 1999). CM investigators follow a 4-phase interviewing structure: 1) Greeting – establish rapport with the interviewee; 2) Explanation – inform the witness about the interview's goals and procedures, 3) Mutual Activity – encourage the witness to discuss a topic, then ask specific questions about that topic, summarize it, and repeat the process until all topics are exhausted, and 4) Closing – terminate the interview on the most positive note possible (Milne & Bull, 1999). Although CM is intuitively appealing, it has not been rigorously tested. George and Clifford (1992, 1996) compared the number of details elicited from 28 UK police officers before and after CM training. In each study, CM did not elicit more information than a 'typical' police interview. Newlands, George, Kemp, and Clifford (1999) recoded George and Clifford's (1992, 1996) interviews to assess the quality, rather than the quantity, of information elicited with CM. Police officers rated witnesses' descriptions of a perpetrator according to their practical use in an investigation and ranked the descriptions from best to worst. Overall, CM-generated information was perceived to be no better than that obtained with a regular police interview.

2.2 - The Cognitive Interview

As can be seen from the preceding review, the use of hypnosis, narrative elaboration, NICHD interviews, Step-wise Interviews and conversation management in an investigative context is limited. Each procedure has several notable faults, or has not been extensively tested. It is also interesting to note that none of these interview techniques have been applied to older witnesses.

The most rigorously examined and widely accepted method for improving witness recall is the Cognitive Interview (CI), which was devised by Geiselman, Fisher and colleagues (Fisher & Geiselman, 1992; Geiselman et al., 1984). Although empirical support for the CI is abundant, explanations of its theoretical underpinnings are limited. The present section considers the principle premises of the CI and describes memory theories that support these.

2.2.1 –Context Effects

One of the key tenets of the CI is that retrieval will be enhanced if the context experienced during encoding is also experienced during retrieval (Fisher & Geiselman, 1992). This notion is a central feature in many existing theories of memory (e.g., Encoding Specificity Principle, Tulving & Thomson, 1973; Headed Records Theory, Morton, Hammersley, & Bekerian, 1985), and is extensively supported by empirical evidence.

Although some of the earliest attempts to explain memory failed to consider the importance of context, they nevertheless played a key role in the development of models that do connect context to successful remembering. Perhaps the most notable of these early theories are the **generation-recognition models**[4] (e.g., Anderson & Bower, 1972; Kintsch, 1970), which assume that learning to-be-remembered items involves attaching a 'tag' to each item's representation in memory (Tulving, 1983). Recall involves two stages – a search process in which possible memory candidates are generated and a selection process in which the most suitable candidate is chosen on the basis of its memory tag. Recognition, on the other hand, entails only the selection process and is predicted to be easier and more accurate than recall because it involves one less step (Brown & Craik, 2000). These models imply that if a detail

[4] Although the specific details of various generation-recognition models differ, their underlying tenets are the same (Parkin, 1991); for the purpose of this review these models will not be considered individually.

is recallable than it should also be recognizable (Anderson & Bower, 1972; although see Muter, 1984).

Many of the predictions outlined in generation-recognition models have not been corroborated (Flexser & Tulving, 1978; Tulving, 1983; Tulving & Thomson, 1973). Tulving and Thomson (1973), for example, showed that in certain circumstances participants perform better at recall than recognition. Participants studied a series of target words such that each word was learned in the context of a second related word (e.g., the target word *black* was presented with the word *train*). When asked to recognize target words that were presented out of their initial context (e.g., the target word *black* in the context of the word *white*) participants were less accurate than when asked to recall target words that were cued with the initial context word. These findings demonstrate that the number of stages in the retrieval process (two in recall, one in recognition, as predicted by generation-recognition models) is less important than the amount of contextual overlap experienced during encoding and retrieval.

On the basis of these results Tulving and Thomson (1973) proposed the **Encoding Specificity Principle,** which holds that successful retrieval depends on the degree of compatibility between the features presented in retrieval cues and those stored in the memory trace (Tulving, 1979). These features can take many different forms. They may be externally experienced conditions or internal thoughts and feelings. However, retrieval will fail if there is no relationship between cue and trace (Tulving, 1983). According to the Encoding Specificity Principle, recognition is usually superior to recall because it provides a retrieval environment that is more similar to that experienced at encoding (Tulving, 1983). Empirical support for the Encoding Specificity Principle has been documented in studies where verbal context (Roediger & Payne, 1983), physical context (Parker, Ngu, & Cassady, 2001), participants' internal pharmacological state (Keleman & Creely, 2003), and mood (Smith, 1995) have been varied (Brown & Craik, 2000; Roediger & Guynn, 1996).

Despite its prominence, the Encoding Specificity Principle has been criticized on several grounds. First, the theory is unfalsifiable because successful retrieval is attributed to the similarity between a cue and memory trace, although in most studies the degree of similarity between a cue and a memory trace is deduced from whether or not recall was successful (Parkin, 1991). Second, the Encoding Specificity Principle asserts that recall and recognition are both affected by context in the same way, although some evidence suggests otherwise. Godden and Baddeley (1975), for example, observed that when a group of scuba divers learned word lists under water and on land, they were better at recalling words when retrieval and encoding occurred in the same environment. These effects disappeared when recognition memory was tested (see also Tulving, 1983). Baddeley (1982) proposed that recall is affected by both intrinsic context (i.e., aspects of the stimulus itself, such as the meaning of a stimulus word), and extrinsic context (i.e., characteristics of the environment, such as whether encoding and retrieval occurred under water or on land). Recognition, on the other hand, is influenced solely by intrinsic context. Consequently, recall is more context-dependent than recognition. Baddeley (1982) also argued that the Encoding Specificity Principle does not account for retrieval processes that vary in complexity. Higham (2002), for example, observed that reinstating contextual information affects retrieval when free-report techniques (where responses to cues can be left blank) are used, but not when forced-report techniques (in which a response must be given for every cue presented) are used.

To address such criticisms, Tulving (1982, 1983) introduced the **Synergistic Ecphory Model of Retrieval.** According to this account, ecphory occurs when appropriate information from a retrieval cue interacts with information from a stored memory trace to produce a recollection. Ecphory is considered to be synergistic because trace information and retrieval information are jointly responsible for recollection. If no retrieval information is available, then recollection will not occur, regardless of how elaborate the stored trace information is. The Synergistic Ecphory Model further posits that a recollection will only result in a positive memory performance if it is strong enough to surpass a certain threshold. The strength of a recollection is a function of both the memory trace and the retrieval environment, and is greater when the information contained in the trace and retrieval cues are abundant, rich and over-lapping. This model posits that the threshold for recognition is low and the threshold for recall is high, hence, when all else is equal, recognition is easier than recall.

Many of the concepts proposed in the Encoding Specificity Principle and Synergistic Ecphory Model are similar to those found in other memory theories. Aspects of these models are present in Koler's (1979) procedural approach which suggests that memory is improved when the mental processes occurring at retrieval replicate those during encoding (see Reingold, 2002, for a review). Similarly, transfer-appropriate processing (Morris, Bransford, & Frank, 1977) postulates that the depth to which learned information is processed during encoding (e.g., the levels of processing framework of memory; Craik & Lockhart, 1972) is less important for successful retrieval than is matching the type of processing activities experienced during encoding and retrieval (see also Roediger & Gallo, 2001). Later research by Lockhart and Craik (1990) reported that although the type of encoding sets limits on one's potential capacity to remember an item, this potential can only be fully realized if encoding and retrieval conditions are compatible.

The **Headed-Records Theory** (Morton et al., 1985) also contends that overlapping encoding and retrieval contexts are necessary for effective remembering. This theory postulates that memories are stored as discrete, unconnected "records" that are each labelled with a distinctive "heading". Records do not decay with time, are accessed through an all-or-none process (i.e., they are either retrieved completely or not retrieved at all), can contain an infinite amount of information, and can only be accessed via their headings. Headings, on the other hand, contain contextual information about the to-be-remembered item including environmental features (e.g., location), and the individual's internal state (e.g., mood) at encoding. Records are retrieved in a search process that compares headings to "descriptions" composed of information from internal and external features of the retrieval environment, as well as the rememberer's goals and intentions. If more than one record for an event exists and such records have similar headings, the most recent headed-record will be accessed. Headed-Records Theory has been used to explain several memory phenomena, such as being reminded of an event but failing to recall it, the misinformation effect, and the differences between recall and recognition (Morton et al., 1985). However, this theory fails to account for the observation that memory deteriorates over time (Milne, 1997), and its assertion that retrieval is an all-or-none process does not explain the partial recall of names (e.g., Cohen & Faulkner, 1986).

2.2.2 –Multiple Pathways to Retrieval

A second premise upon which the CI is based is the notion that memories about an event are stored as interconnected units or nodes. The existence of such networks implies that a single memory can be accessed in several different ways (Eysenck & Keane, 1997). Many connectionist memory models such as Multiple Trace Theory (Bower, 1967), the Parallel Distributed Processing Theory

(McClelland, 1981; McClelland & Rumelhart, 1985; McClelland, Rumelhart, & Hinton, 1986), and the Composite Holographic Associative Recall Model (Metcalfe, 1990) incorporate these principles. Such theories posit that the connections between network nodes are strengthened during encoding and maintain that the pattern of strengthening activity between nodes constitutes a memory representation. Retrieval occurs when a retrieval cue activates one or more of the nodes, which in turn, activates other associated nodes. If the resulting pattern of activity is similar to that experienced during encoding, the memory will be successfully accessed. According to such models, any one of the nodes in a network should theoretically be able to act as a starting point for the spread of activation that will ultimately lead to the production of a memory (McClelland, 1981). Consequently, if one retrieval cue fails, other cues that activate the network at different points might be more successful. Connectionist models have been criticized for being simplistic and too general to account for many of the complexities of memory (Baddeley, 1990; Massaro, 1988).

2.2.3 – Schema Theory

Elements of the CI are also derived from Schema Theory (Bartlett, 1932; Rumelhart, 1980; Schank & Abelson, 1977). Schemas are pre-existing cognitive structures that represent knowledge about a concept and facilitate the organization, interpretation, and retrieval of information (Fiske & Taylor, 1991; Greenberg, Westcott, & Bailey, 1998). During encoding, information about a specific item is deposited into "slots" that are arranged in a network. This network represents pre-existing, generic knowledge about the item in question. Default information exists and can be used to fill in empty slots. Consequently, inferences can be made about the item based on knowledge of similar items (Eysenck & Keane, 1997). Schema Theory is similar to theories in which memory is represented as a network of information nodes (e.g., McClelland, 1981). For example, each theory implies that information about a memory is stored in an interconnected framework and can be accessed by activating the framework at many different points (Memon & Stevenage, 1996a).

Schank and Abelson (1977) were the first to concretely describe Schema Theory. They focused primarily on event-based schemas called scripts. Scripts are knowledge structures for an event sequence that encompass the typical actions, people, and objects encountered during that event (Eysenck & Keane, 1997). Schank and Abelson's **Script Theory** proposed that a familiar situation activates a script that facilitates the mental organization of the event and makes sense of what is happening (e.g., the usual sequence of happenings, appropriate behaviour for the situation). In addition, scripts provide an organised structure that guides memory search processes used during retrieval (Memon & Stevenage, 1996a). As in encoding, if a particular slot is empty during retrieval it can be filled with default information. This process can either benefit memory if the inferred information is correct, or hinder memory if the inferred information is incorrect (Greenberg et al., 1998).

Extensive research has shown that people possess scripts about diverse activities such as the development of personal relationships (Holmberg & MacKenzie, 2002), eating at a restaurant (Chan, Chiu, Lam, Pang, & Chow, 1999), visiting a museum (Moscardo, 1991), and criminal activity (Tuckey & Brewer, 2003). Nevertheless, Script Theory is criticised because it fails to account for the observation that individuals are able to make sense of situations they have not personally experienced (Eysenck & Keane, 1997; Greenberg et al., 1998; Holst & Pezdek, 1992; List, 1986; Mouradian, 2001; Smith & Studebaker, 1996).

To account for such inconsistencies, Schank (1982) developed the **Dynamic Memory Theory,** which states that memory is organised hierarchically. The lowest level of this hierarchy consists of general events that can be arranged in a script-like manner by higher-level structures (Memory Organisation Packets). General events can be combined in several ways depending on the contextual information provided. The highest-level memory structures (Thematic Organisation Points) capture the essence of entire event sequences and exert ultimate control over retrieval (Eysenck & Keane, 1997). Despite being more flexible than Script Theory, however, the Dynamic Memory Theory is still criticized as being too simplistic and rigid (Rumelhart & Ortney, 1977).

Schema Theories are also criticised because they predict that information that is consistent with personal expectations will be remembered better than schema-inconsistent information. Empirical evidence, however, reveals that schema-inconsistent information is more likely to be remembered than schema-consistent information (see Stangor & McMillan, 1992). To account for this observation in recognition, Graesser and colleagues (Graesser, 1981; Woll & Graesser, 1982) devised the **Schema-Pointer Plus Tag Model**, which assumes that schema-consistent information is stored generically in a schema, but inconsistent information is marked with an identifying tag and stored elsewhere. Schema-inconsistent information is, therefore, more likely to be retrieved because it has been stored in a distinctive manner. The **Associative Network Model** (Hastie, 1980; Hastie & Kumar, 1979) was developed to address these issues in recall. This model argues that when schema-incongruent information is associated more strongly with the target item than schema-congruent information (e.g., when inconsistent information is unusual and must be elaborately processed to be understood), inconsistent information will be remembered more easily.

2.3 – Cognitive Interview Mnemonics

Two broad principles are evident in the above review of memory models. First, is the idea that an overlap between encoding and retrieval contexts can facilitate recall. Second, is the notion that memories can be accessed via many different retrieval pathways because they are stored in structures that are dynamic and highly interconnected. The original version of the CI (Geiselman et al., 1984) consists of four mnemonics that stem from these themes: An instruction to mentally reinstate the context of the original event; to report everything; to recall the event using different temporal orders; and to recall the event from a changed perspective. In this section, the mnemonics used in the original CI will be described and their connection to the principles outlined in Section 2.2 will be discussed.

2.3.1 - Context Reinstatement

The *context reinstatement* mnemonic instructs witnesses to mentally recreate the environmental, cognitive, physiological and affective states experienced at the time of a to-be-remembered event (Fisher & McCauley, 1995). Witnesses may be asked to recall the weather, sounds, and smells encountered during an incident, as well as their emotional reactions to it. The primary goal of this technique is to maximize recall by increasing the similarity between encoding and retrieval environments (cf. Tulving & Thomson, 1973). Context reinstatement can be achieved in several ways. It may be physically induced by returning a witness to the scene of a crime (Orbach, Hershkowitz, Lamb, Sternberg, & Horowitz, 2000), or by exposing a witness to certain features of the event (e.g., props; Priestley, Roberts, & Pipe, 1999). Context reinstatement may also be mentally induced by asking witnesses to picture encoding conditions (Geiselman, 1988), or by asking witnesses to remember the order of a sequence of actions (Eldridge, Barnard, & Bekerian, 1992). Although physical context reinstatement has been shown to improve recall in both adults and children (Parker et al., 2001; Smith & Vela, 1992), it may not be practical in an eyewitness situation and could create undue stress for a witness (Milne & Bull, 1999). Mental context reinstatement eliminates the former problem, although Geiselman, Saywitz, and Bornstein (1990) speculated that it might still be traumatic for some witnesses.

2.3.2 - Report Everything

The *report everything* mnemonic asks witnesses to report all the details about an event without editing information that is considered trivial or incomplete. Witnesses may withhold certain information during an interview because they have the (sometimes misguided) belief that it is already known by investigators, or that it is too obvious or irrelevant to report (Milne & Bull, 1999). In other words, schemas about the investigation process, the witnessed event and the role of a witness can influence the amount of information reported in an interview. Asking witnesses to *report everything* reduces the likelihood of such schema-guided responses. By encouraging a thorough account of the to-be-remembered event the *report everything* mnemonic also enhances the degree of contextual overlap between encoding and retrieval (Geiselman, 1988), thereby facilitating recall. In addition, details elicited using the *report everything* mnemonic may prompt the recall of other information (Memon & Köhnken, 1992). Despite its potential usefulness, however, the *report everything* mnemonic is sometimes criticised on the grounds that it lowers a witness' response criterion[5] and may, therefore, increase the recall of incorrect and confabulated details (Roberts & Higham, 2002). In the CI, however, witnesses are specifically instructed to be as complete as possible *without guessing or fabricating*, which should minimise such effects (Fisher, Brennan, & McCauley, 2002).

2.3.3 - Change Order

After providing an initial narrative of an event the witness is instructed to recall it again in a different temporal sequence, such as backwards, or by starting from a previously recalled memorable moment (Memon, Wark, Holley, Bull, &

[5] A response criterion is a benchmark used to decide whether a detail that is remembered should be reported. Response criteria are partly determined by situational demands (Koriat & Goldsmith, 1996).

Köhnken, 1997). The most common procedure is to ask a witness to recall an event in reverse order (Memon & Köhnken, 1992).

In part, the *change order* mnemonic is based on the view that multiple pathways exist for accessing a memory (Fisher & McCauley, 1995). Recalling an event in more than one sequential order is believed to activate different facets of a memory thereby increasing the accessibility of details that were not initially retrieved (Fisher & Geiselman, 1992). The *change order* mnemonic also forces witnesses to examine their actual memory record, which may facilitate the retrieval of information that is not script-based (Milne, 1997). Research by Geiselman and Callot (1990) provided support for this argument. Undergraduate students listened to scenarios about eating in a restaurant and visiting a doctor, and were then asked to recall them in either forward or reverse order. Individuals in the forward-order condition reported more correct schema-consistent information than those in the reverse-order condition. On the other hand, those in the reverse-order condition reported more correct schema-inconsistent information than those in the forward-order condition. Reverse-order recall was also associated with fewer schema-related intrusion errors.

Studies by Anderson and Conway (1993) compared 20-year-olds' memories for an autobiographical event using free recall (i.e., unconstrained by parameters), forward recall (i.e., chronological order), and reverse-order recall. They found that many details reported using free recall were in chronological order, with forward-order recall accounting for 31.5% of the variance of free recall. This suggests that temporal order is an important component of event memory storage (Burt, Watt, Mitchell, & Conway, 1998). Interestingly, participants in the free recall condition used a remembering strategy that involved an initial rapid access of personally significant information followed by a reliance on chronological order recall. Such findings reveal that the best way to elicit a novel pattern of retrieval is to use reverse order recall, as this is the least like natural retrieval processes (Milne, 1997).

However, changing the temporal order of recall could hinder reinstatement of the sequence of witnessed events, and could interfere with the mnemonic to mentally re-create the context of the encoding environment (Bekerian & Dennett, 1993). This may be particularly problematic when instruction for all of the CI mnemonics is given prior to eliciting a witness' free recall account (cf., Geiselman et al., 1984). It is assumed however, that when the *context reinstatement* and *change order* mnemonics are presented individually at different points during the interview (e.g., Fisher & Geiselman, 1992) this should be less of a concern.

2.3.4 - Change Perspective

Individuals tend to report events exclusively from their own viewpoint (Fisher & Geiselman, 1992). The *change perspective* mnemonic encourages retrieval of the same event from another witness' point of view. As with the *change order* mnemonic, using a novel retrieval process activates different aspects of a memory thereby making new details accessible (Bekerian & Dennett, 1993). In addition, the *change perspective* technique is thought to minimise the effects of prior knowledge and expectations, making script-inconsistent information more likely to be reported (Memon, Wark, Holley, Bull, & Köhnken, 1997). Moreover, if a witness (e.g., customer in a bank during a robbery) reports the event from another's (e.g., bank teller) vantage point, the witness will be activating and working from a script that is subtly different from the one used initially. This may trigger memory cues that elicit additional information (Anderson & Pichert, 1978). Furthermore, the *change perspective*, like the *change order* mnemonic, may enhance recall because an additional retrieval attempt is requested. Extra retrieval attempts may result in reminiscence (the recall of details that were not retrieved in an earlier retrieval attempt; Memon & Stevenage, 1996a) and hypermnesia (the amount of new information provided through reminiscence is greater than the amount of information lost by natural forgetting processes, Bluck et al., 1999; Memon & Stevenage, 1996a).

The most commonly cited study to demonstrate the value of the *change perspective* mnemonic was conducted by Anderson and Pichert (1978; also see Adams, 1985; Hasher & Griffin, 1978). Undergraduate students read a scenario about two boys who played truant from school. Half were instructed to read the story as though they were house-buyers and the remainder were asked to read the story as though they were burglars. After recalling the story once, participants recalled the story again from the alternate perspective (i.e., house-buyers became burglars and vice-versa). The second recall elicited information additional to that mentioned initially. However, participants encoded information from a perspective that was not their own and then retrieved details using either this perspective or a second perspective (Milne, 1997). In the CI, on the other hand, perspective shifting occurs only at the retrieval stage, and involves shifting one's *own* perspective to that of someone else. Moreover, the CI generally shifts a witness' perspective to that of another witness (Fisher & Geiselman, 1992; Milne & Bull, 1999), rather than to the perspective of an offender. This is understandable, since asking a witness or victim to describe a crime from an offender's perspective could be traumatic. Nevertheless, it is possible that a witness-offender schema shift could represent a more substantial change to one's retrieval processes than a witness-witness schema shift. Even the use of different witness types (e.g., for a bank robbery: security guard, bank teller, or customer) in the *change perspective* instruction may influence the nature of a witness' retrieval. Few CI studies, however, describe the exact nature of the *change perspective* technique used, or mention whether all participants were consistently asked to assume the same type of perspective shift (e.g., did all participants consider the event from the perspective of the bank teller?).

The *change perspective* mnemonic is perhaps the most widely criticised of all CI techniques, in part, because it is thought to promote the retrieval of inferential details (e.g., Bekerian & Dennett, 1993). For example, Nigro and Neisser (1983) found that when remembering, people sometimes visualise an event as they initially perceived it (field perspective), and sometimes "see" themselves in the memory (observer perspective). The latter perspective is most likely to occur when an event is particularly emotional, and when it involves assuming a vantage point that is different from that experienced at the time of the event. Nigro and Neisser (1983) observed that the observer perspective can cause the rememberer to report schema-consistent information that was not present in the actual event (i.e., to confabulate).

2.4 – The Enhanced Cognitive Interview

The original CI failed to account for many of the difficulties experienced by investigators in real-world situations. First, it provided little guidance about how to structure an interview (Milne & Bull, 1999). Second, it did not outline methods to alleviate witness anxiety (Fisher, Chin, & McCauley, 1990). Finally, it did not incorporate extant knowledge about interpersonal communication (Fisher & Geiselman, 1992). These issues are important to consider given that interviewing officers are not always effective communicators (Fisher, Geiselman, & Raymond, 1987; George, 1991). For example, Fisher et al. (1987) found that a sample of 11 officers frequently interrupted witnesses, used abrupt and closed questions, and asked questions in a sequence that was incompatible with witnesses' mental representations of the crime. Such techniques can interfere with the social dynamics of an interview, and may disrupt a witness' concentration. This, in turn, can compromise testimony (Fisher, 1995).

Fisher and Geiselman (1992) revised the original CI to overcome these communication difficulties and to further improve the interview's cognitive elements. In addition to the four techniques used in the original CI, the **enhanced CI (ECI)** incorporates the following strategies:

1) *Rapport building*: This involves putting the witness at ease by personalizing the encounter and communicating the interviewer's expectations about the forthcoming interview. For example, asking witnesses open-ended questions during the rapport phase is thought to encourage them to provide longer, more detailed answers during the actual interview (Fisher & Geiselman, 1992).

2) The *use of supportive behaviour and appropriate questions*: Witnesses should be permitted to proceed at their own pace, without interruption. If a witness is rushed or interrupted frequently, s/he is likely to conduct only a superficial memory search (Fisher, 1995). The investigator is advised to use verbal (e.g., 'mm hm') and non-verbal (e.g., head nod) behaviour to demonstrate that she or he is listening. The interviewer should ask open-ended questions and only use specific, non-suggestive questions if necessary (Fisher & Geiselman, 1992; Wright & Alison, in press).

3) *Transfer of control*: Interviewers should communicate a lack of knowledge about the witnessed event and stress that the witness is the expert. By placing the interviewee in charge, an interviewer may bolster the interviewee's confidence in his / her own memories (Smith & Ellsworth, 1987). This may increase the amount of information elicited and prevent misleading questions from influencing the witness' responses (Roper & Shewan, 2002).

4) *Focused retrieval*: Recalling specific details from memory requires extensive concentration and attention. Since interviewees are unlikely to develop adequate focus without an appropriate environment and without some encouragement, the ECI interviewer should be certain that the witness is committed to the interview process

(Fisher & Geiselman, 1992). This may involve ensuring that the witness is comfortable, does not feel pressed for time and is not distracted.

5) *Witness compatible questioning*: Every witness has a unique mental representation of an event (Fisher, 1995). It is therefore important for an interviewer to avoid asking all witnesses a standard set of questions in the same sequence. Furthermore, since it has been shown that questions which switch between topic areas can reduce the accessibility of information (e.g., Fisher & Price-Roush, 1986), interviewers should strive to ask all their questions about one topic before proceeding with another.

6) *Mental Imagery*: This technique is similar to the *context reinstatement* mnemonic but is used to help the witness visualize specific aspects of the to-be-remembered-event (e.g., if the witness initially mentioned a car, she or he would be encouraged to create a mental image of it). It has been suggested that imaging can lead to recall errors and false memories, especially in source-monitoring tasks (Loftus, 1998; see also Memon & Higham, 1999). However, Fisher et al. (2002) argued that the visualisation instructions used in imaging experiments are fundamentally different from those given during the CI and are, therefore, not comparable. Participants in source monitoring experiments are asked to visualise a scene that interviewers know is incorrect or a scene that participants have already said did not occur (Garry, Manning, Loftus, & Sherman, 1996). In a CI, however, witnesses are instructed to visualize something they have previously described with the interviewer providing no suggestions about what the image should contain (Fisher et al., 2002).

2.5 – An Appropriate Control Interview

Before examining empirical support for the original and the enhanced CI, the control interview against which these interviews are typically compared will be considered. Initial research involving the CI used a Standard Interview as a control, in which interviewers were not trained in any of the CI mnemonics, or shown how to enhance interviewer-interviewee social dynamics through rapport building and the use of open-ended questions (Memon & Higham, 1999; Memon & Stevenage, 1996b). More recently, Köhnken (1993) developed the Structured Interview (SI) as a control interview. This interview is identical to the CI with the exception that interviewers do not use the CI mnemonics (Memon & Higham, 1999). In general, research has shown that the CI is more effective when it is compared to the Standard Interview than when it is compared to the SI (Memon & Stevenage, 1996a).

Disagreement exists about which of these two control interviews is the most appropriate for assessing the CI[6]. Memon and colleagues (e.g., Memon & Higham, 1999; Memon & Stevenage, 1996d) argued that the Standard Interview is the least effective control interview because it allows for substantial individual differences among interviewers' styles. In addition, they suggested that differences between the CI and the Standard Interview could stem purely from interviewer biases. CI interviewers receive extensive training and may therefore be more motivated than Standard interviewers to perform well (Memon & Higham, 1999). Memon et al. (Memon & Higham, 1999; Memon & Stevenage, 1996d) proposed that the SI is a more relevant control interview because it enables a direct test of the CI mnemonics and, consequently, facilitates a theoretical analysis of the CI.

On the other hand, Fisher (1996) and Geiselman (1996) maintained that since many of the non-cognitive techniques employed in the CI may influence the cognitive ones (and vice versa), the SI is actually not a valid theoretical contrast. Fisher (1996) further argued that a functional, rather than a theoretical, analysis of the CI is more meaningful for real-world investigators, and claimed that the Standard Interview, which is sometimes thought to be more similar to typical police interviews than the SI (Kebbell & Wagstaff, 1996), is the better control. This contention is not substantiated, however, because the techniques employed in the SI are almost identical to those recommended for North American (Yuille et al., 1993) and British (*Achieving Best Evidence in Criminal Proceedings,* Home Office, 2001) police interviewers. Both the SI and the Achieving Best Evidence Interviews, for example, advise that prior to an interview an investigator should relax the witness by discussing neutral events (e.g., hobbies), and by explaining the nature of the interview. Additionally, SI and Achieving Best Evidence interviewers are encouraged to tell the witness that it is acceptable to say that she or he does not know the answer to a question, to stress the importance of not guessing, and to inform the witness that she or he is the expert about what happened. Next, interviewers are encouraged to elicit an uninterrupted free recall account of the event. When the witness has finished this narrative, investigators should ask whether the witness has

[6] The Spanish Standard Interview (Campos & Alonso-Quecuty, 1998) and the Guided Memory Interview (Malpass & Devine, 1981) have also been used as control interviews.

"anything else" to mention before proceeding with specific questions. To avoid possible confusion it is suggested that questions be free from jargon, abstract words, double negatives, and vague nouns. Furthermore, it is advised that SI and Achieving Best Evidence interviewers begin by using open-ended questions and if necessary, move to specific, non-suggestive questions. At all times, it is recommended that interviewers ask questions about one topic before proceeding to another, and that any topic change is made obvious to the interviewee. Investigators are also cautioned against appearing authoritarian as such behaviour can lead the witness to acquiesce with perceived interviewer beliefs (Bain & Baxter, 2000). At the end of the interview it is advised that investigators clarify ambiguous points and summarise important aspects of the interviewee's account. In addition, interviewers should ensure that the interview terminates on a positive note (Home Office, 2001; Köhnken, 1993). Köhnken et al. (1999) recommended the development of a control interview that is more stringent than either the SI or the Standard Interview. However, the effects of the CI mnemonics on cognitive retrieval and social processes must be better understood before devising such a control interview (Memon & Stevenage, 1996d).

2.6 - Empirical Support for the Cognitive and Enhanced Cognitive Interviews

In the past 20 years, the CI has been extensively studied in the laboratory and, to a lesser extent, in field contexts. Although the CI originated in the United States (Geiselman et al., 1984) this protocol has also been examined independently in the United Kingdom (e.g., Holliday, 2003a, b; Memon, Holley, Milne, Köhnken, & Bull, 1994; Milne & Bull, 2003), Germany (e.g., Köhnken, Schimossek, Aschermann, & Hoefer, 1995), Canada (e.g., Turtle, Lawrence, & Leslie, 1994), France (e.g., Py, Ginet, Desperies, & Cathey, 1997), Australia (e.g., McMahon, 2000), and Spain (e.g., Campos & Alonso-Quecuty, 1999).

Laboratory studies of the CI share similar methodology. Participants witness either a live incident or view a film that depicts a simulated incident, and are then asked to recall the event in an interview that is conducted a few hours, days, or weeks later. Participants are given either a CI or a control interview. Interviews are tape-recorded then transcribed and scored for the number of correct and erroneous details recalled (Fisher et al., 2002).

In the earliest of these studies (Geiselman et al., 1984), 16 university students witnessed an argument during a lecture and were asked to complete a questionnaire about this disruption two days later. Those who were instructed in the original CI mnemonics (*context reinstatement*, *report everything*, *change order*, and *change perspective*) before recall reported significantly more correct information about the incident than control participants who were instructed to keep trying to remember details. No significant increases were observed in the amount of incorrect or confabulated information reported. Despite such promising results, however, this study was limited its use of a small sample (Geiselman, 1988).

A series of follow-up studies were conducted. The first of these involved a larger sample of undergraduates (N = 89) as well as a longer, more complex videotaped crime scenario (Geiselman, Fisher, MacKinnon, & Holland, 1985). After a two-day delay, participants were instructed in the original four cognitive mnemonics and then asked to recall the events in the video. This time, however, interactive interviews conducted by real law enforcement agents were used. The original CI elicited more (35%) correct information than a Standard Interview with no corresponding increase in the number of erroneous details (cf. Geiselman et al., 1984). These results were replicated by Geiselman, Fisher, MacKinnon, and Holland (1986) using a non-student participant group, and by researchers in independent laboratories (e.g., Aschermann, Mantwill, & Köhnken, 1991). Overall, such studies have revealed that the original CI elicits an average of 30-35% more information than control interviews, without increases in the number of incorrect details reported (Bekerian & Dennett, 1993; Fisher, 1995).

The first study to evaluate the ECI (Fisher, Geiselman, Raymond, Jurkevitch, & Warhafting, 1987) did not include a control interview, and instead compared the ECI against the original version of the CI. Sixteen students were shown a video and were interviewed two days later by other students. The ECI elicited 45% more correct information than the original CI, with no loss in accuracy. The first study to compare the ECI with a control interview was conducted by George (1991). University students watched two actors disrupt a class, and were interviewed by police officers trained in either the ECI or a control interview two weeks later. Overall, the ECI elicited 35% more correct information than the control interview, with no increase in errors.

Field studies have also provided support for the ECI's efficacy. Fisher, Geiselman and Amador (1989) tape-recorded interviews that were conducted by detectives from the Metro-Dade Police Department's Robbery Division. Half of the officers were trained in the ECI and were again asked to tape-record several interviews. No significant differences were found in the number of details elicited in the control (not ECI-trained) and experimental (ECI-trained) groups before training. After training, however, the experimental group elicited 47% more information than before training, and 63% more information than the control group. Although it is impossible to assess the accuracy of information obtained from real-life police interviews, Fisher et al. (1989) found that 94% of the details provided by interviewees were corroborated. A second field study was conducted by George and Clifford (1992). Investigators again tape-recorded their interviews before and after receiving ECI training; a control group of investigators received no training. Those trained in the ECI elicited 55% more information after training than before training, and 14% more information than the untrained group.

One notable criticism of these studies is that interviewers' motivation to perform successful interviews may have been influenced by the amount of training they received (Memon et al., 1994; Rosenthal & Rubin, 1978). Memon and colleagues (Memon et al., 1994; Memon & Higham, 1999; Memon & Stevenage, 1996a) noted that many early CI studies failed to specify the amount and type of training given to interviewers. Such information is critical, however, as longer training sessions may be needed to help interviewers reduce the cognitive load associated with using the original and enhanced CIs, and to motivate them to conduct high-quality interviews (Memon & Higham, 1999). The definition of appropriate training remains unresolved. Some researchers have recommended using an intensive two-day training programme (Fisher, 1995; George, 1991). Others have suggested that four hours of training is adequate (Fisher et al., 1989; Köhnken et al., 1995; Memon & Higham, 1999).

Is an ECI more effective than the original CI? Research has shown that the ECI results in up to 70% more correct information than the original version (Fisher, 1995; Fisher et al., 1987). Nevertheless, a meta-analysis of 27 original CI and 28 ECI comparisons involving both children and adult participants (Köhnken et al., 1999) revealed no significant differences in the number of correct details elicited by these interviews. Köhnken et al. (1999) also found that the ECI resulted in more erroneous details than the original CI. This observation may be explained, in part, by the fact that the original version of the CI was generally compared against 'Standard' control interviews, whereas the ECI was typically tested against 'Structured' control interviews (Köhnken et al., 1999).

Köhnken et al. (1999) also reported that the original and enhanced CIs elicited 41% more correct information than control interviews. Specifically, the CIs elicited the most correct information when participants were exposed to a realistic to-be-remembered scenario (e.g., witnessing a live staged event, rather than a videotaped event), and when they were actively involved in a to-be-remembered incident. This increase in correct information was accompanied by a 25% increase in the average number of erroneous details recalled, although CI participants' overall accuracy rate was comparable to that of individuals given a control (Standard or Structured) interview (CI = 85% accurate, control interview = 82% accurate). This pattern of results demonstrates that the CI elicits significantly more information than control interviews, and that the accuracy of this extra information is not compromised (Köhnken et al., 1999).

Indeed, only four of the 55 studies included in the analyses did not find an increase in the number of correct details recalled with the CI (i.e., Saywitz, Geiselman, & Bornstein, 1992; Mantwill, Aschermann, & Köhnken, 1992; Memon, Cronin, Eaves, & Bull, 1993; Memon et al., 1994). Köhnken et al. (1999) posited that Mantwill et al. (1992) failed to find significant effects for the CI because of low interviewee motivation; Memon et al. (1993) failed to find effects because they interviewed young children (6-years) with a developmentally inappropriate CI; and Memon et al. (1994) failed to find effects because they used insufficiently trained interviewers. The reason why Saywitz et al. (1992) did not find effects was reported to be unclear (Köhnken et al., 1999).

2.6.1 – The Cognitive Interview: A Robust Protocol

The CI's ability to improve recall has been observed in many different methodological situations. For example, the CI has been useful in epidemiological studies that ask participants to remember daily activities performed in the distant past (i.e., 35 years ago; Fisher, Falkner, Trevisan, & McCauley, 2000), and in nutritional studies that rely on memory for dietary intake (e.g., Armstrong et al., 2000).

The CI's ability to enhance recall has also been examined using more atypical groups such as individuals with intellectual impairments. Three such studies have been conducted (Brown & Geiselman, 1990; Milne & Bull, 1996; Milne, Clare, &

Bull, 1999). Brown and Geiselman (1990) reported that a CI elicited 32% more information than a Structured Interview, with no corresponding increase in the number of incorrect details, when administered to adults with intellectual impairments. In addition, a significant, albeit slight, increase in the number of confabulations was found, although the accuracy rates of each interview were comparable. Milne et al. (1999) examined the effects of a CI versus a Structured Interview on adults with and without learning disabilities. Although individuals from the general population recalled more correct information and made fewer confabulations than those with learning disabilities, the latter group recalled 35% more correct information when given the CI than when given the Structured Interview. Milne and Bull (1996) found that the CI increased the amount of correct information recalled and resulted in higher accuracy than the Structured Interview when used with children with learning disabilities.

Research that has evaluated the effects of CIs on non-learning disabled children has also reported encouraging outcomes. In general, results demonstrate that when used with children over the age of 7-years, a CI increases the amount of correct information recalled by approximately 25-70%, with accuracy rates remaining constant or improving (e.g., Akehurst, Milne, & Köhnken, 2003; Fisher et al., 2002; Holliday, 2003a, b; Larsson, et al. 2003). Several studies have examined the use of a CI with children under the age of 7-years. Memon et al. (1996) reported no difference in 5-9-year-old children's abilities to recall a staged event when given a CI versus when encouraged to "try harder". On the other hand, Muller and Bussey (1999), Holliday (2003a, b) and Holliday and Albon (2004) developmentally modified a CI and found that children recalled more correct information in a CI than in a Structured Interview. The CI has also been shown to improve children's recall for an event after delays of 2-3 weeks (Memon, Wark, Bull, & Köhnken, 1997; Aschermann et al., 1991). Similarly, Larsson, Granhag, & Spjut (2003) reported that after a 6-month interval, a CI elicited significantly more accurate information from 10-11-year-olds than a Structured Interview. More longitudinal research of this kind would be beneficial because it is common for extended periods of time to pass before witnesses appear in court (Ceci & Bruck, 1995; Larsson et al., 2003).

Several studies, primarily conducted with children (e.g., Hayes & Delamothe, 1997, Holliday, 2003a, b; Holliday & Albon, 2004; although see Geiselman, Fisher, Cohen, Holland, & Surtes, 1986; Robinson & Briggs, 1997), have also examined the

CI's ability to minimize the harmful effects of misleading information. Most of this research demonstrates that modified versions of a CI reduced misinformation effects if given prior to (e.g., Geiselman et al., 1986; Memon, Holley, Wark, Bull, & Köhnken, 1996; Milne & Bull, 2003), but not after (e.g., Geiselman et al., 1986; Hayes & Delamothe, 1997), participants' exposure to misinformation. Conversely, Holliday (2003a, b) found that the type of interview given prior to misleading information did not affect children's reporting of misinformation. When misinformation was presented before interviews, however, Holliday (2003b) found that self-generated misinformation was reduced with a CI. As Holliday (2003a, b) noted, such contradictory findings may be the result of methodological differences between studies, such as different ways of measuring suggestibility (e.g., degree of resistance to misleading information, versus the difference between performance on misleading and control items), and different ways of invoking suggestibility (e.g., interviewer-generated, versus witness-generated).

In summary, the CI generally increases the amount of information recalled by witnesses without decreasing accuracy. The CI is a robust interview protocol whose effects remain stable even when longer retention intervals, misinformation, and atypical witness groups are encountered.

2.7 – Criticisms of the Cognitive Interview

Despite the well-documented success of the CI this technique is not without criticism. Kebbell, Milne, and Wagstaff (1999) reported that although police officers rated the CI as useful, they were concerned that it takes longer to conduct than a SI. Indeed, some studies support the observation that a CI can be more time-consuming (e.g., Hayes & Delamothe, 1997; Holliday, 2003a; Mello & Fisher, 1996; Milne et al., 1999). The additional time it takes to conduct a CI is worthwhile because it generally elicits more information than a regular interview (Kebbell et al., 1999; Köhnken et al., 1999), however, given the many demands and time constraints placed on officers, a longer interviewing process may be less desirable (Kebbell & Wagstaff, 1996). Furthermore, in the case of minor crimes, officers report that a CI often serves little purpose because not enough resources are available to follow the additional leads it creates (Kebbell & Wagstaff, 1996).

The *change perspective* mnemonic has also attracted criticism (Boon & Noon, 1994; Milne & Bull, 1999). In particular, it has been suggested that the *change* *perspective* mnemonic might be considered a form of hearsay evidence that is inadmissible in court, or it may be seen as an invitation for the witness to fabricate responses (Boon & Noon, 1994).

Moreover, many officers feel that it is inappropriate to ask traumatized witnesses or victims to recreate vivid mental images about the crime and to re-live their experiences (e.g., *context reinstatement*; Milne & Bull, 1999). However, Shepherd, Mortimer, Turner, and Watson (1999) argued that a CI can be therapeutic because many of the CI mnemonics are similar to instructions used by cognitive-behaviour therapists. For example, cognitive-behaviour therapists ask clients to repeatedly create and describe mental images of a traumatic event in order to decrease the arousal associated with this memory, and to create a more organized memory record (Foa & Riggs, 1993; Shepherd et al., 1999). Such organization facilitates integration of the traumatic memory into the client's existing schemata and allows the event to be self-evaluated (Foa & Riggs, 1993; Rothbaum & Foa, 1996).

2.8 - Examining the Effects of Individual Cognitive Mnemonics

Police officers often omit specific CI mnemonics when conducting a CI. Clifford and George (1996), for example, found that officers were less likely to use the *change order* and *change perspective* mnemonics. Boon and Noon (1994) reported that the only technique used routinely by officers in the field was the *report everything* instruction. In order to determine whether all of the CI mnemonics are necessary for recall enhancement, or whether some could be eliminated to make the interview faster and easier, some researchers have examined the separate effects of each CI mnemonic (e.g., Boon & Noon, 1994; Geiselman et al., 1986; Milne & Bull, 2002) and combinations of mnemonics (e.g., Holliday & Albon, 2004).

In one of the earliest studies to assess the CI's cognitive components, Geiselman et al. (1986) observed that a full CI resulted in more correct information from university students than single instructions to either *reinstate the context* or *report everything*. In turn, participants in each of these conditions recalled more correct information than those given a Standard Interview. No significant differences were observed in the number of incorrect details recalled across each condition. These results reveal that although the *context reinstatement* and *report everything* mnemonics are useful on their own, they are less effective than a full CI. Boon and Noon (1994) found that individual *report everything*, *change order*, and *context* *reinstatement* mnemonics each improved 18-21-year-olds' recall by approximately the same amount, when compared to a "try again" instruction. The *change perspective* mnemonic did not improve recall. In this study, however, each mnemonic was preceded with a *report everything* instruction, making it impossible to separate their effects from those of the *report everything* mnemonic (Milne & Bull, 2002). Using a design that did not combine the *report everything* mnemonic with the other mnemonics, Memon, Cronin, Eaves, and Bull (1996) found no differences in young adults' (17-18-years; Experiment 1) and children's (5-9-years) recall across *change perspective, context reinstatement, change order,* or control (i.e., try harder) groups. Such results suggest that individual CI mnemonics have no effect on recall beyond a general motivational instruction (Memon et al., 1996).

More recently, Milne and Bull (2002) asked participants (aged 5-45-years) to watch a video and freely recall it before being asked to either: *Reinstate the context*; *report everything*; *change perspective*; *change order*; *report everything and reinstate the context*; or try again. No significant differences in the number of correct, incorrect, or confabulated details were found across *context reinstatement, change order, change perspective, report everything* or control (try again) groups (cf. Memon et al., 1996). The *report everything and reinstate the context* condition, however, elicited more correct details than *report everything, change perspective, change order,* and try again interviews. This pattern of results suggests that each mnemonic may contribute incrementally to the CI's effect, or that a combination of some of the mnemonics is necessary to enhance recall (Milne & Bull, 2002). In addition, adults reported more correct details than 5-6-year-olds, although there were no significant differences in the number of correct details recalled by adults and 8-9-year-olds. Interestingly, it was also found that 5-6-year-olds had the highest percentage accuracy score (85%) when using the *change perspective* instruction, while 8-9-year-olds had the lowest percentage accuracy score (76%) when using the *change order* mnemonic.

No research has examined all possible permutations of individual CI mnemonics including the social elements of the ECI (e.g., transfer control; Milne & Bull, 2002). A study of this kind is important because individual CI mnemonics may be most effective when operating in conjunction with communication-enhancing techniques.

2.9 – Are Cognitive Interview Improvements Due to Cognitive or Social Factors?

The observation that the CI's effects are sometimes less pronounced when compared to Structured, rather than to Standard, Interviews suggests that CI-related recall enhancement is influenced by the CI's improved communication techniques (Memon & Stevenage, 1996a). Although uncertainty exists about whether the cognitive or the social aspects of a CI provide the largest contribution to recall (Mello & Fisher, 1996), most researchers concur that these elements are inter-dependent. Memon and Higham (1999), for example, noted that a witness may be more relaxed and receptive to using the CI mnemonics if interviewer-interviewee rapport has first been established. Similarly, in order for the *context reinstatement* mnemonic to be effective the interviewer must be patient and give the witness sufficient time to concentrate (Memon et al., 1997a).

2.10 - Types of Details Elicited by a Cognitive Interview

Some kinds of information are remembered more easily than others (Bekerian & Dennett, 1993). For example, witnesses often have great difficulty reporting information about people because translating certain mental representations (e.g., shape of a face) to verbal descriptions can be difficult (Sporer, 1996). It is therefore worthwhile to evaluate whether a CI is able to enhance recall of *all* types of information, or whether it results in differential amounts and qualities of recall for specific kinds of details (Akehurst, et al., 2003; Bekerian & Dennett, 1993; Memon et al., 1997b). The identification of such patterns in recall would augment existing knowledge about how the CI mnemonics function, and could be used to assess the integrity of witness accounts. For example, in the extreme case that all of the errors produced by CI interviews are person-related, but never object- or action-related, police officers may have a better idea about which details to rely on.

Most of the recent studies to report detail types have used children as participants and have produced disparate results. Milne, Bull, Köhnken, and Memon (1995), for example, observed that a CI elicited more correct information about people and actions than a SI, whereas Memon et al. (1997b) and Granhag and Spjut (2001) found that a CI produced more correct object and action details. Others have noted that a CI elicits more correct person, object, and action details (e.g., Holliday, 2003a, b), as well as more details about the surrounding location (e.g., Holliday, 2003b; Holliday & Albon, 2004). Still others have observed that a CI only produces more correct action details (Akehurst et al., 2003), or more correct person and object details (Milne & Bull, 2003). With the exception of Memon et al. (1997a), who found that the CI elicited more incorrect person details than a SI, no significant differences in the types of incorrect or confabulated details recalled have been observed.

Studies that report detail types elicited from adult participants are less common, but again demonstrate mixed results. Geiselman et al. (1984) observed that the CI resulted in more correct person and action (event) details than a Standard Interview. Memon, Cronin, Eaves, and Bull (1993) found that a CI elicited more correct location details than a SI. Memon et al. (1994) and Memon, Bull, and Smith (1995) reported no significant differences in the number of correct detail types elicited with the CI and SI. Such variability between studies may partly be due to differences in the type of event used as a stimulus (e.g., if an event involved many actors, there would be more person details to report), developmental differences among participants (children, Akehurst et al., 2003; Holliday, 2003a, b; adults, Geiselman et al., 1984), or to differences in the stimulus theme (birthday party, Holliday, 2003a, b; shoplifting, Akehurst et al., 2003). Specifically, the reporting of detail types may vary as a function of their salience within an event (Akehurst et al., 2003).

2.11 – Coding and Scoring Responses

Differences in interview coding methods exist. Many researchers draft an exhaustive list of all potential details about the to-be-remembered event (e.g., Campos & Alonso-Quecuty, 1999; Geiselman, 1988; McMahon, 2000; Memon et al., 1997a, b). This template is scored for detail types and is then compared against participants' responses to assess detail accuracy. Other researchers, however, compare single units[7] of information elicited from a participant directly against an event checklist (Gwyer & Clifford, 1997; Mello & Fisher, 1996). If a participant reports a detail that is not on the template/checklist, it is checked directly against the stimulus, scored for accuracy, and added to the template/checklist (Akehurst et al.,

[7] Different definitions of the term 'unit' exist (Baker-Ward, Ornstein, Gordon, Follmer, & Clubb, 1995; Dickenson & Poole, 2000). Participants' recall may be compared against a checklist that refers to the main features of a to-be-remembered event (e.g., in the case of a physical examination by a doctor, features may include concepts such as listens to chest, checks throat; Gordon et al., 1993). Similarly, recall may be compared against specific grammatical units (e.g., "he hit the ball" contains 3 grammatical units – 'he', 'hit' and 'ball'; e.g., Milne & Bull, 2003).

2003; Milne & Bull, 2002, 2003). In addition, some researchers employ a weighted scoring system to account for level of recall specificity (e.g., dog = 1 point, Poodle = 2 points) (Milne & Bull, 2002; Mello & Fisher, 1996), while others assign equal weight to every detail (e.g., Holliday, 2003a, b; Memon et al., 1997a, b). Many of these methods assumes the importance of every single detail in the to-be-remembered event. As Roberts and Higham (2002) noted, however, such scoring systems fail to consider whether the information elicited by participants is useful to a police investigation. Instead, Roberts and Higham (2002) advocated using police officers to develop a coding template that is investigatively relevant and, therefore, has greater ecological validity.

A second criticism related to coding, concerns the way that uncertain responses (e.g., "I'm not sure, he *might* have had a hat") are scored. Some researchers do not differentiate between certain (e.g., "he had a hat") and uncertain responses, while others place uncertain responses in a separate category for scoring (e.g., Memon et al., 1994; Memon, Bull, & Smith, 1995). Many researchers do not indicate how they code witness responses that reflect uncertainty or supposition (e.g., Holliday, 2003a, b; Memon et al., 1997a, b; Milne & Bull, 2003). Such information is important, however, because memory accuracy is thought to improve when a witness adopts a conservative criterion about the details she or he reports (Koriat & Goldsmith, 1996; Memon & Higham, 1999).

Discrepancies in scoring testimony for accuracy are also apparent. Early studies to evaluate the CI compared the number of correct and erroneous details recalled in the CI condition with the number of correct and erroneous details recalled in control conditions (Geiselman et al., 1984; Geiselman, 1988). Later researchers suggested that it was also important to consider the *type* of errors made, and refined the definition of errors to encompass details that were both *incorrect* (e.g., witness reports a *pink,* instead of *purple,* hat), and *confabulated* (e.g., witness reports *gun* when no weapon present) (e.g., Holliday, 2003 a, b; Memon, Wark, Bull, & Köhnken, 1996). In addition to examining the absolute number of correct, incorrect, and confabulated details reported, some studies have determined the accuracy rate of participants' responses (e.g., Holliday, 2003a, b; Mello & Fisher, 1996). Typically, accuracy rate is defined as the number of correct details divided by the total number of responses made (i.e., all correct, incorrect, and confabulated statements; Fisher et al., 2002; McMahon, 2000).

Controversy exists about whether *absolute accuracy*, defined as the actual number of correct, incorrect, and confabulated details reported, or *accuracy rate* provides the most appropriate measure of the CI's forensic relevance. This issue is important because the CI sometimes leads to an increase in the absolute number of erroneous details reported but does not lower accuracy rates (Fisher et al., 2002; Köhnken et al., 1999). Fisher and colleagues (e.g., Fisher, 1996; Fisher et al., 2002) maintained that accuracy rate is the better measure because it enables data to be standardized. Without standardization, comparison across conditions would be meaningless because the total number of details recalled in each interview condition varies considerably (i.e., the CI generally produces more details than control interviews). Fisher et al. (2002) presented an analogy in which the reader was asked to imagine two witnesses who each provide 100 details with a 90% accuracy rate. Although interviewing both witnesses will result in more errors (20) than interviewing only one (10), having 200 details at 90% accuracy is more investigatively useful than having 100 details at 90% accuracy. Similarly, the CI produces more information (both correct and incorrect) than control interviews, while maintaining the same (or a slightly higher) level of accuracy.

Higham and Roberts (1996a) argued that accuracy rate is not always the best standard for assessment. They suggested that a jury might construe an interview with a high number of absolute errors to be unreliable, even though the interview actually has a high accuracy rate. Memon and Higham (1999) agreed that it is important to use an accuracy measure that is corrected for the amount of information obtained (cf. Fisher et al., 2002), but noted that accuracy rate is not necessarily the most appropriate technique for this purpose. Memon and Higham (1999) argued that accuracy rate fails to account for the amount and the type of information that is left *unreported* by a witness. To illustrate this point, Memon and Higham (1999) described two interviewees, both of whom report an absolute accuracy measure of 16 correct and 4 incorrect details (i.e., each has an 80% accuracy rate). However, if both interviewees also fail to report information during the interviews, such that the first interviewee withheld 16 erroneous and 4 correct details, while the second interviewee withheld 4 erroneous and 16 correct details, a different pattern emerges. The second interviewee, although correct 80% of the time, is poor at determining which memories are correct or erroneous (Memon & Higham, 1999). CI experiments typically do not generate enough information to enable analyses that account for both accuracy and ability to discriminate between correct and erroneous details (Higham & Roberts, 1996a; Memon & Higham, 1999). Recent research, therefore, has devised alternative measures of recall performance that are more sensitive than absolute accuracy and accuracy rate.

One such method asks participants to rate their confidence about the accuracy of their statements (Roberts & Higham, 2002). According to this method, high levels of confidence are related to high accuracy. Although Koriat and Goldsmith (1996) found that confidence is a good predictor of accuracy, other researchers have failed to support this claim (e.g., Bekerian & Dennett, 1993; Brewer, Keast, & Rishworth, 2002; Geiselman, Schroppel, Turbridy, Konishi, & Rodriguez, 2000). An alternative procedure involves asking participants to decide whether reported details are remembered or known (e.g., Geiselman et al., 2000). A detail that is remembered is consciously recalled and the participant is able to retrieve contextual information about it. Conversely, if a detail is known, the participant believes the detail was observed but cannot retrieve contextual information about it (Memon & Higham, 1999). Remember statements have been shown to be more accurate than know statements (Smith et al., 2003) although some research fails to support this claim (e,g., Geiselman, et al., 2000; Roediger, Jacoby, & McDermott, 1996, Bekerian & Dennett, 1994).

One criticism of this technique is that asking participants to make remember / know decisions during the course of an interview could disrupt the interview process, and could interfere with CI mnemonics, such as the instruction to *report everything* (Memon & Stevenage, 1996c). Furthermore, it has been shown that self-report measures are not pure measures of participants' underlying cognitive processes (Holliday & Hayes, 2000). Higham and Roberts (1996b), however, suggested that remember / know statements can be identified *after* an interview, by examining the interview transcript. Specifically, they proposed that a remember judgement could be assigned if a reported detail is accompanied by contextual information (e.g., if a witness remembers that a thief was holding a gun because he noticed that the thief had a wedding ring on his finger). If no contextual information is recalled (e.g., if the witness only recalls that the thief had a gun) then a know judgement would be assigned (Higham & Roberts, 1996b). The value of such a coding system is questionable, however, since the concept of contextual information is rather vague.

In the above example, "wearing a ring" was considered to be contextual information, but is also an important detail in its own right.

2.12 – Improving Older Witnesses' Recall with a Cognitive Interview

This section will consider whether the CI mnemonics are suitable for enhancing the quality and quantity of older adults' recall, and will examine the three studies that have tested the CI with this age group.

2.12.1 – Using Cognitive Interview Mnemonics with Older Adults

When older adults are given environmental support at encoding or retrieval their recall accuracy can be as high as that of younger adults (Sharps & Antonelli, 1997; Smith, 1977). For example, Smith (1977) showed that support during retrieval minimized age-related free recall effects. While older adults (60-80-years) recalled fewer correct words from a list than two groups of younger adults (20-39-years, 40-59-years), these age differences disappeared when taxonomic category labels (e.g., "a metal" for the target word "zinc") were used as semantic memory cues. The CI, which uses cognitive mnemonics to enhance memory retrieval, may therefore provide older adults with sufficient support to facilitate recall.

Older adults often have difficulty recalling the context in which an event occurred, and the source of a particular memory (e.g., Mitchell et al., 2003). Efforts to improve contextual information at retrieval, such as the *context reinstatement* mnemonic, may enhance older adults' recall for such details. Indeed, research suggests that older adults, like younger adults, benefit from physical (Fernandez & Alonso, 2001) and mental (Yarmey & Yarmey, 1997) context reinstatement when attempting to recall information. Yarmey and Yarmey (1997), for example, asked participants (18-65-years) to estimate the length of time they had spent with a target individual after either receiving instructions to mentally rehearse the scene or not receiving any instructions. All participants, regardless of their age, were more accurate after mentally rehearsing the scene. On the other hand, older adults are not as proficient as young adults at ordering to-be-remembered items in the correct temporal sequence (Grober & Sliwinski, 1991; Schmitter-Edgecombe & Simpson, 2001; Vakir, Weise, & Enbar, 1997). Although this implies that the *change order* mnemonic may be more challenging for older participants, it may nevertheless facilitate recall by invoking a novel pattern of retrieval, and by reducing reliance on script knowledge (Fisher & Geiselman, 1992).

Older adults have also been reported to be poorer than younger adults at performing visuo-spatial tasks that involve perspective-changing, that is, tasks in which they must consider a view that is different from their current view (Herman & Coyne, 1980; Inagaki et al., 2002; Kirasic, 1989). Inagaki et al. (2002) presented young (18-29-years), middle-aged (30-59-years) and older (61-86-years) adults with a tray of building blocks and asked them to describe how the blocks would look if they were standing on the opposite side of the tray. Perspective-changing ability decreased with advancing age, which suggests that the *change perspective* mnemonic might be less effective for older witnesses. Nevertheless, when older participants are asked to recall information from a previously encountered perspective (i.e., the setting was familiar) their perspective-changing ability improved (Herman & Coyne, 1980; Kirasic, 1989). Many older adult witnesses are likely to have some familiarity with their surroundings (e.g., purse snatched on the way home from post office), which may make it easier for them to apply the *change perspective* mnemonic. Furthermore, the instructions given during most perspective-changing studies (e.g., describe something as if "you were standing over there") are different from the *change perspective* mnemonic, which asks participants to consider an event from another witness' point of view. The extra instruction to "take the viewpoint of someone who had a different role in the event" may make it easier for the older participant to change perspective.

The CI's emphasis on transferring control to the witness, ensuring that retrieval is focused, and using witness compatible questioning, are particularly likely to benefit older adults who may have slower cognitive processing speeds, and a limited pool of cognitive resources (Park et al., 1996; Salthouse, 1996a). Furthermore, older adults are sometimes reported to be overly cautious (e.g., Rush, Panek, & Russell, 1990), which may cause them to withhold information during an investigative interview (Mello & Fisher, 1996). By stressing the importance of reporting any detail, regardless of its perceived insignificance (*report everything* mnemonic), the CI may help to overcome difficulties of this kind.

2.12.2 – Cognitive Interview Research with Older Witnesses

Only three published studies have assessed a CI's effectiveness with older witnesses (McMahon, 2000; Mello & Fisher, 1996; Searcy et al., 2001). In the earliest of these, younger (18-35-years) and older (65-80-years) adults watched a videotape of a simulated robbery (Mello & Fisher, 1996). Thirty minutes later, participants were given a standard police interview, an ECI, or a modified CI (MCI - conducted only with older participants). Mello and Fisher (1996) reasoned that a CI tailored to the specific cognitive needs of older adults would enhance recall. Based on Herman and Coyne's (1980) findings that older adults have difficulty reporting incidents from a perspective other than their own, Mello and Fisher (1996) omitted the *change perspective* mnemonic from their MCI. In addition, because older adults have been found to be relatively poor at unprompted free-recall (Craik, 1977; Pratt, Boyes, Robins, & Manchester, 1989) interviewees' opening narratives were restricted. The final modification involved exaggerating the social components of the ECI by substantially slowing the pace of each interview, by wording questions as simply as possible, and by taking extra care to avoid interruptions.

As expected, within-age comparisons of the ECI and the Standard Interview revealed that the ECI was more effective at eliciting correct details, but also resulted in more incorrect information. Contrary to other studies involving older witnesses (e.g., Brimacombe et al., 1997), older individuals provided more correct information than younger adults when given the ECI, and as much correct information as younger adults when given the Standard Interview. When accuracy rate was determined, however, main effects of age and interview type were not found. Similarly, there was no significant interaction between age and type of interview. No differences were found between older participants' performance on the ECI and MCI in terms of the number of correct details recalled, the number of incorrect details recalled, or accuracy rate. Failure to observe age-related recall differences may have resulted from the fact that all older participants were recruited from a continuing education course at a local university and therefore possessed intellectual interests and capacities that were not representative of the general aged community (McMahon, 2000). Nevertheless, Mello and Fisher's (1996) results do demonstrate that some older adults make very capable witnesses. Mello and Fisher (1996) suggested that a significant difference in the amount of correct information elicited by the MCI and the ECI was not found because the modifications made in the MCI were improperly employed or because such modifications were simply unnecessary. However, it is also conceivable that several of the elements included in Mello and Fisher's MCI were inappropriate. Encouraging participants to make their opening free-recalls brief may have been perceived as a sign that the interviewer was not interested. This may have led some participants to doubt the importance of their recollections, and may have lessened their confidence throughout the rest of the interview. As well, exaggerating the already leisurely speed of the ECI interview and using over-simplified vocabulary may have been considered patronizing by some participants, thereby disrupting interviewer-witness rapport.

In addition, because interviewers were aware of the experimental hypotheses, their expectations may have resulted in systematic differences in the length of interviews, or in the number and quality of questions asked in interviews of each condition (Hayes & Delamothe, 1997). Mello and Fisher's use of the Standard Interview as a control can also be criticized (e.g., Memon & Stevenage, 1996a).

McMahon (2000) compared the amount of correct, incorrect, and confabulated details reported by younger (18-50-years) and older (60-88-years) adults when each was given a SI or an ECI 30 minutes after viewing a to-be-remembered video. Overall, the ECI was no more effective than the SI at eliciting complete or accurate information, with the SI producing superior recall from younger participants. McMahon also observed that younger adults gave more correct information than older individuals, although these groups showed no significant differences in the number of incorrect or confabulated details reported. When accuracy rate was considered, no significant effects for age group, type of interview, or for the interaction between age group and interview type were found (cf. Mello & Fisher, 1996). Although McMahon's sample of older individuals was more representative of the general aged community than that of Mello and Fisher (1996), it is still open to criticism. The use of a small number of participants in each condition (40 participants split into 4 groups), coupled with large participant age ranges (i.e., younger = 32 years; older = 28 years), may have made the observed results less reliable.

The most recent study to compare the effects of a CI and SI on older adults' recall was conducted by Searcy et al. (2001). Younger (18-30-years) and older (62-79-years) adults were asked to interact with a confederate for 20 minutes prior to viewing one emotionally arousing video and two neutral videos. The use of four different to-be-remembered events (real-life interaction with confederate, arousing video, two neutral videos) was designed to mirror conditions that are experienced by actual witnesses. One month later, participants were interviewed about the earlier session using either a SI or a modified version of the CI in which the *change order* and *change perspective* techniques were omitted. Younger participants recalled more correct information than older adults, although the mean number of details reported and the accuracy of recall did not differ between modified CI and SI conditions. It is possible, however, that the modified CI used by Searcy et al. (2001) was less effective than a full CI. Indeed, CI mnemonics may work additively, such that a combination of several mnemonics is necessary to enhance recall (Milne & Bull, 2002). It is also possible that a one-month delay between the stimulus event and interview was too long for some of the CI mnemonics to be helpful. Context reinstatement, for example, may only be useful after shorter delays, when associations between the stimulus and context are stronger (Hashtroudi et al., 1989; Searcy et al., 2001).

The mixed findings from research that has tested the CI with older adults (McMahon, 2000; Mello & Fisher, 1996; Searcy et al., 2001) may be due, in part, to methodological differences between studies. For example, the fact that different control interviews (Standard versus Structured), different retrieval delays (30 minutes versus one month), different versions of the CI (complete versus versions in which either the *change perspective* mnemonic, or both the *change perspective* and *change order* mnemonics were omitted), and different to-be-remembered stimuli (video-taped event versus a live event plus videos) were used. It is also interesting to note that none of these studies has categorized recall according to detail type (e.g., person, action, object, surrounding), and no studies have tested the CI with older adults who show signs of cognitive impairment.

2.13 – Chapter Summary

This chapter began with a description of five different types of investigative interview protocols: Hypnosis; narrative elaboration; NICHD; Step-Wise; and conversation management. These methods are not well supported by empirical evidence, so will not be pursued as instruments for improving older witnesses' recall in the present thesis. Next, the original and enhanced versions of the Cognitive Interview (CI) were described and shown to be reliable alternatives to the aforementioned interviews. The social and cognitive foundations of the CI were examined and the memory models that support these tenets were described. Finally, the CI's capacity to improve older witnesses' recall was considered and the few published studies to test the CI's efficacy with this group were critically examined. The results of these studies are mixed, although much of this inconsistency is likely due to methodological discrepancies.

2.14 – Rationale for Empirical Studies

As noted in Chapter I, the primary aim of the present thesis is to improve the quality and quantity of older witnesses' recall for a to-be-remembered event. Specifically, this thesis examines the use of the Cognitive Interview and a modified version of the Cognitive Interview as tools to achieve recall enhancement among various groups of older adults, including those who display signs of cognitive impairment.

Study 1. Before addressing the above issues, it was considered valuable to examine the opinions of individuals who actually interview older witnesses. Consequently, the first study in this thesis (Chapter III) asked officers from the UK to: Comment on the usefulness of current interviewing protocols; explain the interviewing techniques they use with older witnesses; describe the challenges encountered with this group; and express their attitudes about using a CI with older witnesses. In addition, because information about officers' perceptions of older witnesses is scarce, Study 1 explored officers' attitudes toward this group.

Study 2. To determine whether a CI improves older witnesses' recall, Study 2 (Chapter IV) compared the quality and quantity of older adults' recall when given a typical UK police interview (the Structured Interview), the ECI, or a modified version of the CI. The modified CI was identical to the ECI except that the *change perspective* technique, which is the most controversial CI mnemonic (Boon & Noon, 1994) and may be difficult for older adults to use (Herman & Coyne, 1980), was omitted. In this study, the limitations of earlier research involving older adults and the CI (McMahon, 2000; Mello & Fisher, 1996; Searcy et al., 2001) were addressed. For example, older adult participants were more representative of the general older community and were divided into two age groups (young-old and old-old, cf. Brimacombe et al., 2003). Larger sample sizes and a coding scheme that accounted for detail types (e.g., Person, Action) were also used.

Study 3. The third study (Chapter V) replicated the results obtained in Study 2, this time using only young (18-31-years) and young-old (60-75-years) adults. Study 3 also addressed some of the limitations inherent in Study 2. Specifically, participants' education level was considered, depressed individuals were screened from the sample, and the post-stimulus distraction task was altered.

Study 4. The final study (Chapter VI) extended the findings from Studies 2 and 3, by determining whether the ECI and the modified CI were able to improve recall quality and quantity among older adults who show signs of cognitive impairment. Eyewitness research has largely ignored cognitively impaired older adults and has not yet examined whether the CI benefits the recall of this group.

Chapter III:

Police Perceptions of Older Witnesses

The study outlined in this chapter examined English police officers' perceptions about older witnesses (i.e., > 60-years). Specifically, this study explored officers' beliefs about the reliability and thoroughness of older witnesses' reports and considered reasons for these beliefs. In addition, officers' opinions about current interviewing protocols for older witnesses, including the Cognitive Interview, were explored and the challenges officers encounter with this witness group were revealed.

Studies that have examined attitudes towards older witnesses have shown that this group is generally believed to be more honest, but less accurate and less credible, than younger adult witnesses (Brimacombe et al., 1997; Kwong See et al., 2001; Nunez et al., 1999; Ross et al., 1990). To date, research has concentrated almost exclusively on mock-jurors' perceptions of older witnesses (e.g., Brimacombe et al., 1997, 2003; Ross et al., 1990). It is just as important, however, to consider the attitudes of police officers, given that the police are usually the first authority encountered by a witness (Yarmey, 1984). If an officer feels that an older witness is not able to provide reliable or thorough testimony it may negatively influence the direction or scope of an investigation. Indeed, age-related stereotypes have been found to affect the degree to which older witnesses' testimony is believed by mock-jurors (Kwong See et al., 2001; Nunez et al., 1999). Nevertheless, only two Canadian studies have examined police officers' views about older witnesses (Yarmey, 1984; Yarmey & Jones, 1982).

As part of a larger study examining awareness of the factors that affect eyewitness identification (e.g., stress, cross-racial identification, age), Yarmey and Jones (1982) asked Canadian police officers, psychological experts, lawyers, judges, students, and members of the community to consider older[8] witnesses' ability to describe a crime. Only 12% of the officers perceived older witnesses to be less accurate than younger adult witnesses. Conversely, 42% of the officers perceived older witnesses to be just as accurate as younger witnesses. A further 23% of officers indicated that older witnesses are as accurate as younger witnesses if interviewed

[8] In both the Yarmey and Jones (1982) and Yarmey (1984) studies, the terms "older witness" and "younger witness" were not defined in terms of specific age ranges.

immediately after the incident. In total, 85% of the officers expressed a positive attitude about the accuracy of older witnesses.

Results from a subsequent study suggested that Canadian police officers do not allow their perceptions of older witnesses to influence their evaluative judgments about this group's credibility. Yarmey (1984) asked a sample of police officers, lawyers, probation officers, older adults, and members of the general public to rate older witnesses on a range of abilities. Participants indicated their attitudes by filling in 12 bipolar adjective scales (scored 1-7), which were classified as evaluative (e.g., good-bad, honest-dishonest), activity-related (e.g., fast-slow), potency-related (e.g., strong-weak), and understandability-related (e.g., mysterious-understandable). Police officers and older participants, unlike the other groups, stated that older witnesses had high evaluative worth. Police perceptions about older witnesses' levels of activity, potency, and understandability were similar to those of lawyers and probation officers, but less favourable than the attitudes of older participants. Overall, the general public rated older witnesses more negatively than did the other groups.

Nevertheless, the Yarmey and Jones (1982) and Yarmey (1984) studies contained a number of limitations. First, the group of police officers surveyed in each study was relatively small (N = 26, N = 20, respectively). Hence, the reported findings may not be representative of the entire police community. Indeed, the fact that all the police officers included in Yarmey's (1984) study were male supports this assertion. Second, each of these studies was conducted two decades ago, using police officers from a particular geographical region in Canada. It is likely that the attitudes of Canadian police officers differ from those of English officers, and that police attitudes toward older adults have altered during the past 20 years. Various initiatives have been introduced recently to increase UK officers' awareness about different witness groups such as children and vulnerable adults, including older adults (Home Office, 2001). Third, the rating scales used by Yarmey (1984) to measure participants' attitudes were limited. Combining good-bad and honest-dishonest scales into a single "evaluative" measure assumes that judgements about witness honesty are similar to judgements about witness ability. As earlier studies involving mock-jurors demonstrated, however, these two characteristics are perceived quite differently. Older witnesses are often thought to be more honest, but less accurate, than young adults (e.g., Brimacombe et al., 1997). Fourth, because Yarmey and

Jones (1982) were testing participants' *knowledge* about older witnesses, their results may not accurately reflect participants' *perceptions* of this witness group.

Study 1 addressed these issues by using a larger and more representative sample of respondents. In addition, it sought to obtain a purer measure of officers' perceptions about older witnesses by using simple scales to assess beliefs, and by asking officers to explain the reasons for their beliefs. The present study also invited officers to comment on the usefulness of current interviewing protocols, to discuss the techniques used with older witnesses, and to describe some of the challenges encountered with this group. Furthermore, officers were asked to express their attitudes about using the CI with older witnesses.

In accord with research involving mock-jurors (e.g., Brimacombe et al., 1997), it was predicted that officers would generally express negative attitudes about older adults' ability to act as competent witnesses. Moreover, because prior research has found that officers are often concerned with the length of time it takes to conduct a CI, the difficulty of explaining certain CI mnemonics, and the possibility that the CI will be more traumatic for witnesses than a typical police interview (e.g., Kebbell et al., 1999; Kebbell & Wagstaff, 1996), it was predicted that most officers would express an aversion to using this protocol with older witnesses.

3.1 - Method

3.1.1 – Participants

Participants were contacted either through the Chief Officer at the police station where they worked or via the Institute of Police and Criminological Studies at the University of Portsmouth (IPCS). Overall, 502 questionnaires were distributed and 164 were returned (response rate = 32.7%). Of these, 131 were returned from officers who had been contacted via their Chief Officer (see Table 3.1; response rate = 43.4%), and 33 were returned from officers at the IPCS (response rate = 16.5%). Five respondents were excluded because they were either military police or office clerks.

Of the 159 participants included in the final sample, 23.9% were female, 56.6% were police constables, 18.2% were detective constables, 5.0% were sergeants, 13.8% were detective sergeants, 3.1% were inspectors, and 3.1% were detective inspectors. Respondents' ages ranged from 22- to 55-years (M = 35.81-years, SD = 7.07), and their length of service with the police ranged from 1- to 30-

years (M = 11.67-years, SD = 7.35). Participants reported that they had an average of 10.86-years (SD = 7.18) experience interviewing witnesses.

Table 3.1

Distribution and return rates of questionnaires by geographical region in England

Region	Number of Forces Participating	Number of Surveys Sent	Number of Surveys Returned
London	4	55	14
South East	3	40	24
South West	3	50	20
East	3	54	19
Midlands	2	35	15
North East	2	20	14
North West	3	48	19
Not specified			6
	19	302	131

Annual statistical returns (HM Inspectorate of Constabulary, 2002) indicate that 17.9% of officers in England and Wales are female, 78.2% are police constables or detective constables, 14.6% are sergeants or detective sergeants, and 4.9% are inspectors or detective inspectors. The present sample is therefore representative of the national police force.

3.1.2 - Materials

The questionnaire consisted of 17 items and is included in Appendix A. Participants were first asked to provide information about their age, gender, rank, length of service with the police, and experience interviewing witnesses and victims. Next, officers were asked to: Outline the interview protocols they use; estimate the frequency with which child and older witnesses are encountered; indicate how reliable and thorough they perceive older witnesses to be; describe the greatest challenges faced when interviewing older witnesses; and describe their views about using the CI with older adults.

3.1.3 - Procedure

A copy of the questionnaire was sent to the Chief Officers of 7-10 randomly selected police stations from each geographical region in England (see Table 3.1). A letter (see Appendix B) explained the nature of the study and asked Chief Officers about distributing the questionnaire among their staff. Over a 9-month period, 60 such letters were sent to police stations across England. Chief Officers who agreed to participate (N = 19, acceptance rate = 31.7%) were asked to distribute questionnaires among volunteer officers, regardless of age, sex, rank of office, or level of experience (see Appendix C for complete instructions). Those who declined stated time pressures due to heavy caseloads and short-staffing. In addition, 200 police officers enrolled in correspondence courses with the IPCS were asked to complete and return the questionnaire in their own time. Questionnaires were included in the course training packs compiled by the Institute.

3.1.4 - Coding

Officers' responses to open-ended questions (i.e., questions 5, 7b, 8, 13, 14, 15b, 16 & 17b) were scored according to the content dictionary described in Appendix D. The dictionary was drafted after 60 questionnaires had been collected and was designed to be an exhaustive list containing every possible response made by officers. As each remaining questionnaire was scored, any responses that were not present in the initial dictionary were added. A second independent rater scored the open-ended questions of 16 randomly selected questionnaires. When the rater was unsure about how to code a particular response it was discussed with the primary researcher until both individuals concurred. Agreement between the two raters' was $r = .78$, $p < .001$. All remaining questions either required a yes / no answer, or asked participants to select a response option from a scale (e.g. 1 to 7). Because such measures were objective and straightforward, they required no additional coding.

3.2 - Results

3.2.1 - How Common are Interviews with Older Witnesses?

Around 1/10th of officers (10.7%) stated they encountered older witnesses over 50% of the time. To establish a frame of reference for how often different witness types are encountered, officers were also asked to estimate how frequently they interviewed child witnesses. Fifteen percent indicated that they encountered child witnesses over 50% of the time (see Table 3.2). When the proportion of time spent interviewing was rated on a Likert-scale from 1 to 10, a paired-samples t-test revealed that officers interviewed children more often (M = 3.58) than older adults (M = 2.91), t = 3.31, df = 158, p < .01.

Table 3.2

The percentage of respondents who spend x % of their time interviewing older adult and child witnesses

Time Spent Interviewing (%)	Time Spent Interviewing (1-10)	% of Officers who Encounter	
		Older Adults	Children
0-10%	1	25.2[a]	16.4
11-20%	2	25.8	18.9
21-30%	3	21.4	20.8
31-40%	4	10.7	16.4
41-50%	5	5.7	11.9
51-60%	6	5.7	6.3
61-70%	7	1.9	2.5
71-80%	8	3.1	3.8
81-90%	9	0.6	0.6
91-100%	10	0	1.9
Left blank		0.6	0.6

[a] 25.2% of respondents spend 1-10% of their time interviewing older adults.

3.2.2 - Perceptions of Witness Reliability and Thoroughness

When officers were asked to rate the reliability of older compared to younger adult witnesses, 51.6% indicated that older witnesses are less reliable, 33.9% indicated they are just as reliable, and 14.5% indicated they are more reliable (see Table 3.3). Similarly, 54.1% of officers indicated that the reports of older witnesses are less thorough, 33.3% felt that older witnesses were just as thorough and 12.6% felt that older witnesses were more thorough, than those of younger adults (see Table 3.3).

Table 3.3

Officers' perceived reliability and thoroughness of older witnesses

	% of Responses	
	Reliable	Thorough
1 (much less)	3.8	3.1
2	14.5	15.1
3	33.3	35.8
4 (similar)	34.0	33.3
5	10.7	8.8
6	3.8	3.8
7 (much more)	0	0

To determine whether perceptions about the reliability and thoroughness of older witnesses was related to the frequency with which officers encounter such witnesses, officers were divided into two groups using a median split: Group A – little contact with older witnesses (i.e., reported contact < 20%, $N = 81$); and Group B – moderate to high contact with older witnesses (i.e., reported contact > 20%, $N = 78$). Two separate 2 (contact group: A, B) univariate ANOVAs using reliability and thoroughness as dependent variables, respectively, revealed no significant differences. Specifically, the reported reliability of older witnesses was not dependent on the amount of contact with such witnesses ($M_{low} = 3.35$, $M_{moderate\text{-}high} = 3.55$), $F(1, 157) = 1.39$, $MSE = 1.69$, $p = .24$, nor was reported thoroughness related to amount of contact ($M_{low} = 3.32$, $M_{moderate\text{-}high} = 3.50$), $F(1, 157) = 1.12$, $MSE = 1.27$, $p = .29$[9].

Reasons for reported reliability and thoroughness ratings were provided by 130 officers. These reasons can be summarised in three categories: (1) Favourable attitudes towards the abilities of older witnesses; (2) unfavourable attitudes; and (3) beliefs that witness ability is independent of age. These categories of responses are explored below.

Favourable statements about older witnesses. Thirteen percent of officers stated that older adults make better witnesses than young adults because they are more intelligent and more experienced. For example, one officer suggested that,

[9] In addition, no significant correlations were observed between the frequency with which officers encountered older witnesses and their perceptions of witness reliability ($r = .11$, $p = .18$) or thoroughness ($r = .12$, $p = .12$).

"older people look at people with (a) wider life experience and therefore have a broader pallet within which to describe things". Five percent stated that older adults make better witnesses because they are more willing to help the police than younger adults; 5% indicated that older adults are very adept at remembering information (e.g., "sometimes it is a preconception / stereotype that (the) elderly won't be able to remember because they are older, but I have found (that) elderly people (are) extremely sharp-minded and recall facts extremely well").

Unfavourable statements about older witnesses. One third (32%) of the officers stated that older people pay less attention to details and are poorer than young adults at describing product brand names and people. As one officer stated, "elderly people are often unable to make important distinctions such as types of cars, brand names of clothing, even nationalities, having grown up in a 'white dominated' environment". Twenty-three percent reported that such witnesses lose focus easily and are often confused in an interview situation. For example, one officer stated that, "the older the eyewitness, the more confused they get", and another claimed that, "They wander off the subject and reminisce. They enjoy the experience of being interviewed and are very difficult to keep focused". A further 21% indicated that older witnesses are more forgetful and have poorer memories than young adults, while 19% believed older adults make worse witnesses because of their declining physical abilities (e.g., vision).

Reliability does not depend on age. Thirty-one percent of respondents indicated that an individual's personal capacity rather than age was the most important determinant for success as an eyewitness. For example, one officer stated that, "unless the elderly person has a disability to affect sight, hearing, smell or cognitive ability, there is no reason why they would not be able to take in an event under stressful conditions as many younger witnesses". Similarly, another noted that "just because a witness is elderly does not mean they are less able as witnesses, unless they are suffering from an illness which effects recall, e.g., Alzheimer's". Interestingly, five officers suggested that the quality of witness testimony depends more on the interviewer's performance (e.g., quality of questions asked) than on the interviewee's ability. For example, one officer stated that, "the officer's interviewing skills determine how much information can be obtained", and another officer claimed that, "if you put enough time / effort into interviewing [older people] can give you valuable information".

3.2.3 - Perceived Usefulness of Current Protocols[10] for Interviewing Older Witnesses

When participants were asked whether the interview protocol they typically use facilitates their job and meets the needs of older witnesses, 65% responded yes, 31% responded no, and the remainder did not respond. "No" respondents were asked to describe how the protocol could be improved. Twenty-three of these officers stated they would like more extensive training, for example, "our training has not been directed to different ages, cultures or creed. A more directed training module to different ages and potential problems associated with the mind / memory of an older person would be useful". Seventeen said they would like to use video interviewing more often, and 15 stated they would like more time to interview older witnesses. For example, one officer claimed, "if we could spend more time with them, that would really help. The nature of our work places us in a position of doing 'just enough' as other jobs / demands are too pressing, and elderly eyewitnesses shouldn't be rushed". A further 13 respondents thought that more victim support and follow-up advice should be given to older adults as "they are often very shaken by a crime". Other suggestions made by less than 10% of the respondents included, "taking the statements of elderly people sooner", "making more officers available", and "using an interviewer who is familiar to the older eyewitness".

3.2.4 - Techniques Employed when Interviewing Older Adults

Officers experienced at interviewing older witnesses were asked whether they use the same interview methods with younger (i.e., > 60-years) and older (i.e., < 60-years) witnesses. Those who use different methods were asked to describe these techniques. Fifty-two percent stated they use the same methods when interviewing older and younger adults. As one such officer wrote, "I feel that to treat elderly witnesses differently, e.g., as child(ren), vulnerable, would be an insult to the individual". Thirty-six percent modify their interviewing style when addressing an older witness. The most commonly reported interview modifications included: slowing the pace of the interview (N = 37); being more patient and respectful (N = 24); and using additional verbal and non-verbal prompts (N = 7). Nine officers reported using interviews that are tailored to the specific needs of each witness.

[10] For the purposes of the present study, 'current protocol' was not defined for officers. This was intended to compensate for the fact that different police constabularies sometimes use slightly different interviewing protocols (Gloucestershire County Council Annual Report, 2002). Some of the problems associated with failing to define 'current protocol' are mentioned in the discussion.

Three officers stated that older witnesses require more persistent prompting than young adults (e.g., "you need to draw everything from them", and, "often leading questions need to be used to extract the account").

3.2.5 - Challenges Encountered when Interviewing Older Adults

Officers who had some experience with older witnesses were asked to describe the greatest challenges they faced when interviewing this group. Of the 138 participants who responded, 26% stated that managing an older person's distress and confusion was problematic. For example, one officer said, "(older adults) may be more emotionally affected by an incident than a younger person", while another officer wrote that it was hard to, "convey a sense of purpose to the victim. There is a barrier of the elderly witness feeling like they are a burden". Twenty-five percent claimed that memory problems made older witnesses difficult to interview, while 22% stated that it is hard to keep such witnesses focused on the incident in question (e.g., "often they haven't seen anyone in ages so they relish the company and talk about everything – sometimes not including what you are dealing with" and, "keeping them on the subject you are there to talk about. The elderly often want to spend a great deal of time wanting to chat about their lives in general"). In addition, 21% of officers mentioned that time constraints present a challenge. For example, one officer noted, "job / time pressures don't allow you to sit down and extract the fine detail like you want". A further 20% were often frustrated by the physical decline experienced by some older witnesses (e.g., "the fact that they can't always hear what I'm saying is a challenge" and, "problems occur when there is a medical problem"). Fourteen percent admitted that it was difficult to communicate with older people and cited rapport development as a key problem. For example, one officer stated that it was often challenging to, "develop proper rapport and understanding" with older witnesses, and another mentioned that older people, "may not be familiar with the modern jargon (language used by younger generation)". Challenges reported by < 10% of respondents included coping with personal stress (e.g., "I feel more emotional and responsible when an elderly person has become the victim of crime, or have been 'dragged' into witnessing a crime"), and dealing with the stereotypes and biases that older adults sometimes hold.

3.2.6 - Cognitive Interviews and Older Adults

Officers who had experience interviewing older adults were asked whether they had used a CI with such witnesses. Ninety-nine participants responded yes, 35 responded no, and the remainder did not respond. Of those who had used a CI with older adults, 36% believed it was a valuable interviewing tool. One such officer described the CI as being, "very effective in general", but stipulated that, "it is a very good idea to explain (the interview) to the witness first, and, subject to circumstances, inject some humour, e.g., when looking at the scenario from an alternate view stage (i.e., when using the change perspective technique), explain that they will almost certainly add new information - they do!" Another officer maintained that, "the Cognitive Interview works for most types of witnesses, provided they have the capacity to concentrate and allow themselves to get into context. If the elderly person is unable to concentrate, the Cognitive Interview won't work. If the Cognitive Interview can't be used, it is unlikely very much info will be obtained from any other method of interview".

In contrast, 37% of the officers who had conducted a CI with older witnesses believed that this technique was not useful. Many were concerned that CIs were not practical (e.g., "it's too long drawn out and there is no time in a busy environment to fully employ this method"). Others stated that CIs were not appropriate for older witnesses, for example, "elderly people are generally set in their ways and like to tell you (things in) their own way. To try and change the method in which they relate (information) to you upsets their concentration" and, "... cognitive type interviews are hard work. Elderly people tend to think you're mad during contexting (i.e., context reinstatement) and lose patience during free recall".

Officers who had never used CIs with older witnesses cited three reasons. First, the CI was too long to be of practical use. Second, the CI was too mentally demanding for older adults (e.g., "it is a long process that they may find difficult and not understand" and "I believe that the elderly person can be put off by going through the long CI, they get tired"). Third, a CI would be too upsetting for the witness (e.g., "I wouldn't want an elderly person who had suffered a traumatic event to try and put themselves back there in their mind's eye. I feel I would be re-exposing them to the trauma").

3.3 - Discussion

A key finding of this study was that more than half of the officers surveyed stated that older witnesses (> 60-years) are less reliable and less thorough than young adult witnesses (< 60-years). As predicted, these results are consistent with mock-jurors' beliefs that the testimony of older adults is less accurate than that of young adults (e.g., Ross et al., 1990). No support was found for Yarmey and colleagues' (Yarmey, 1984; Yarmey & Jones, 1982) findings that police officers perceive old and young witnesses to be equally competent. The discrepancy between the present findings and those of Yarmey and colleagues is likely due to several factors. First, the sample sizes in Yarmey's studies were small compared to the present study. Second, considerable cultural differences in the beliefs of English and Canadian police officers may exist. Third, it is likely that police attitudes towards older adults have changed during the two decades following Yarmey's work. Fourth, Yarmey and colleagues combined honesty and accuracy evaluations in the same measure and hence, may have masked officers' true beliefs. Honesty and accuracy represent two unique constructs, such that older adults are generally considered to be more honest but less accurate than younger adults (Brimacombe et al., 1997).

Officers' negative perceptions of older witnesses may reflect a belief that older adults typically perform worse on memory tasks than young adults (Yarmey, 2000; Yarmey & Kent, 1980). In some cases, however, such beliefs may create a self-fulfilling prophecy. If an officer assumes that all older adults make poor witnesses, that officer may expect fewer recalled details from this group and hence, may conduct interviews that are less than satisfactory. In turn, such interviews serve to reinforce the belief that older witnesses are inferior (Davidson & Eden, 2000). Although increased exposure to a stereotyped group improves perceptions of that group (Hayes, Vaughan, Medeiros, & Dubuque, 2002; Praisner, 2003), the present study found that the amount of contact with older witnesses did not influence feelings towards this group as a whole. This may be because officers were inaccurate in estimating the frequency with which they encounter older witnesses. It is common for people to misjudge the frequency with which an event occurs (Baron, 1998). Very high frequency events are often underestimated and very low frequency events are often over-estimated (e.g., Lichtenstein, Slovic, Fischhoff, Layman, & Combs, 1978).

A second finding was that over a third of the officers who had used the CI with older witnesses believed, as predicted, that the CI is inappropriate for older adults because it is too time-consuming and arduous. Participants who had not used the CI with older witnesses often mirrored these sentiments, citing them as reasons for not using this technique. The observation that officers perceive the CI to be overly lengthy is not a novel one (Kebbell et al., 1999; Kebbell & Wagstaff, 1996). Nevertheless, the extra time it takes to conduct a CI is worthwhile because it typically elicits more information than a regular interview (Kebbell et al., 1999; Köhnken et al., 1999). However, little research has examined whether the CI is too arduous for older adults. Some elements of the CI could be particularly difficult for older adults. For example, older adults have been shown to be poorer than young adults at performing visuo-spatial tasks in which they must consider a view that is different from their current view (Herman & Coyne, 1980; Inagaki et al., 2002). This suggests that the *change perspective* mnemonic of the CI might be less effective for older witnesses. Other aspects of the CI, however, may not be difficult for older adults. For example, Yarmey and Yarmey (1997) found that mental context reinstatement improved 18-65-year-olds' recall accuracy regardless of age.

A small group of officers stated that a CI could be too upsetting for an older victim. There is a dearth of research on the impact of crime on the mental well being of older victims (Simpson, Morley, & Baldwin, 1996). However, Wolf (2000) argued that older victims may experience more emotional upset than younger ones, even when the criminal act is the same or less serious. By extension, older witnesses may also feel more traumatised when recounting a crime to interviewers. In contrast, Kato, Asukai, Miyake, Minakawa, and Nishiyama (1996) found that older adults can be more resilient to certain traumatic incidents than younger adults. After experiencing a severe earthquake, younger (< 60-years) and older (> 60-years) participants initially experienced sleep disturbance, depression, hypersensitivity, and irritability. After 8 weeks, however, older but not younger adults showed a significant decrease in many of these symptoms. Psychosocial factors (e.g., the availability of sufficient support networks) and past experience (i.e., having already lived through several earthquakes) were thought to be responsible for older adults' improved coping ability. It should be noted, however, that in many cases older witnesses or victims might not have access to extensive social support (Krause, 1987).

Officers who stated that the CI is a valuable technique for interviewing older witnesses often qualified their views by noting that it is only useful if the mnemonics are explained thoroughly and if the witness has an average intellectual capacity. Although the few studies to test the CI with intellectually impaired young adults and children have demonstrated that it enhances recall (e.g., Milne et al., 1999), no published research has examined the CI's effects on impaired older adults such as those with dementia. This limitation in the extant literature will be addressed in Study 4, which will test the prediction that the CI will improve the recall of older adults who show signs of cognitive impairment.

Another notable finding was that officers reported interviewing older witnesses 21-30% of the time, on average, which is slightly higher than the British Crime Survey's (2003) reported rates of older adult victimization. The British Crime Survey reported that 7.8%, 17.9%, and 15.2% of the victims of violent crimes, vehicle-related theft and burglary, respectively, were over the age of 65. The discrepancy between the two sets of statistics is likely due to the fact that the British Crime Survey focussed on crime *victims*, whereas the present study was concerned with both witnesses and victims. The British Crime Survey also did not consider cases of abuse or neglect although these types of crimes are common against older adults (Brogden & Nijhar, 2000). It may also be the case that officers' frequency estimates were not entirely accurate. As mentioned previously, frequency estimates are sometimes misjudged (Lichtenstein et al., 1978).

A second point of interest concerning interview frequency is that officers stated they interview older adults only slightly less often than child witnesses. In general, research has tended to focus more on child, rather than older adult witnesses. A search of the abstracts listed in *PsychInfo* between 1990 and 2003 retrieved 155 abstracts containing the term "child witness", but only four containing the terms "elderly witness" or "older witness". Therefore, even though officers stated that they encounter older witnesses almost as frequently as child witnesses, research in the past thirteen years has largely ignored the older witness. This trend may be explained by the recent increase in reporting of child abuse and by the fact that children's reports have been a key issue in several well-publicised court cases (see Ceci & Bruck, 1995, for a review).

Several officers indicated that the current protocols for interviewing older witnesses would benefit from improvement. The most commonly desired improvement was "more training", which suggests that it may be worthwhile for basic police training courses to include a session about older witnesses. Other recommended improvements were using video-interviewing techniques with older adults, devoting more time to older witnesses, and providing them with more extensive follow-up support. A recent police initiative to create specialist Adult Protection Units (e.g., Norfolk, Gloucestershire Constabularies) may address some of these issues. Officers who are assigned to Adult Protection Units attend a one-week training course that informs them about the needs of vulnerable adult witnesses and victims, teaches them to conduct video-interviews with vulnerable adults, provides practical experience with interviewing (training is based on the *Achieving Best Evidence* interview, Home Office, 2001), and explores alternatives for victim support. At the time the present survey was conducted, few Adult Protection Units were fully operational (Lowe, personal communication, 2001). Nevertheless, suitable training and the involvement of specialist Adult Protection officers may reduce interviewee anxiety and distress, cited to be one of the greatest challenges officers experience when interviewing older witnesses. Such training might also help overcome challenges associated with older adults' physical difficulties (e.g., hearing, medical problems), and difficulties relating to this witness group (e.g., use appropriate terminology, develop rapport).

Many officers pointed out that it is particularly difficult to interview older adults with memory loss. The CI, which has been shown to enhance the recall of many different witness groups (e.g., children, Akehurst et al., 2003; Larsson et al., 2003; adults, Gwyer & Clifford, 1997; people with intellectual impairments, Milne & Bull, 1996), and which incorporates techniques that could specifically benefit older adults (e.g., *context reinstatement*, Yarmey & Yarmey, 1997), may be an effective means of improving older adults' eyewitness memories. Although tests of the CI's efficacy with older witnesses have yielded mixed results (McMahon, 2000; Mello & Fisher, 1996), the methodology of these studies can be criticized on several grounds, such as using small sample sizes and inappropriate control interviews. Studies 2 and 3 (Chapters IV and V) will address these methodological issues and will examine whether the CI is a useful technique for improving older adults' recall.

Another frequently cited challenge was having little time to conduct interviews. Kebbell and Milne (1998) also found that many police officers in the UK reported that they never, or only rarely, had enough time to conduct what they considered to be a good interview. To compensate for such time constraints, officers may employ an interviewing strategy that is designed to help them extract information quickly, such as deliberately using closed questions and interrupting witnesses (Kebbell & Milne, 1998). This type of questioning is far from ideal as it can hinder effective interviewer-interviewee communication (Wright & Alison, in press). One solution to this problem would be to allow officers more time to conduct interviews, however, limited resources make this impractical at the present time (Kebbell & Wagstaff, 1996).

A related concern expressed by several officers is that it is difficult to keep some older adults focused during an interview. Consistent with this observation, several researchers have found that older adults' speech tends to be more prolonged and irrelevant than that of younger adults, a phenomenon known as "off-topic verbosity" (OTV; Arbuckle & Pushkar-Gold, 1993; James, Burke, Austin, & Hulme, 1998). OTV is frequently explained using the Inhibitory Deficit hypothesis, which posits that older adults have less efficient inhibitory control mechanisms than younger adults (Hasher & Zacks, 1988). Although this deficit is believed to disrupt memory functioning, it is also thought to interfere with language production and comprehension (Arbuckle & Pushkar-Gold, 1993). The Inhibitory Deficit model predicts that during the course of language production, older adults retrieve more irrelevant thoughts about the topic being discussed, and are less able to suppress these (James et al., 1998). Indeed, the frequency and severity of OTV has been linked to inhibitory processes, although psychosocial factors such as high extraversion, stress, and unsatisfactory social support are also implicated (Arbuckle & Pushkar-Gold, 1993). Since OTV is an intrinsic characteristic of many older adults' speech, officers should attempt to accommodate it as much as possible. Although listening to older witnesses' digressions and politely directing conversation back to the topic in question may require additional patience, time and skill, it may ultimately improve the quality of older witnesses' accounts.

Many of the officers who had experience with older witnesses indicated that they modify their interviewing style with this group. Often, officers reported that such modifications involve slowing the pace of an interview and showing the interviewee more patience and respect. These techniques correspond with theories that suggest older adults' cognitive processing capacity is limited, and are supported by observations that processing speed mediates the effects of age on memory (Park et al., 1996; Salthouse, 1996a). Giving older witnesses enough time to consider questions and to frame their responses may minimize processing pressures and therefore facilitate recall. Nevertheless, if the pace of an interview is excessively slow, some older adults may feel that they are being patronized, which could be detrimental for interviewer-interviewee rapport. Indeed, La Tourette and Meeks (2000) found that older adults who live in the community and in nursing homes reacted less favourably to patronizing speech, and perceived individuals who use patronizing speech to be less respectful, nurturing, competent, and benevolent.

A small number of officers stated that they use extra verbal and non-verbal encouragement when interviewing older witnesses. When given unconditionally, such reinforcement may provide a supportive environment that puts a witness at ease (Fisher & Geiselman, 1992) and can increase the recall accuracy of vulnerable witness groups (Carter, Bottoms, & Levine, 1996). However, investigators who rely on this technique should be careful to avoid selectively reinforcing responses that are consistent with their own expectations (e.g., giving reinforcement only when a witness says something negative about an alleged offender). Selective reinforcement can have a shaping influence that may lead to false allegations and identifications among vulnerable witnesses (e.g., Garven, Wood, & Malpass, 2000).

A few officers also commented that older witnesses require extensive prompting and suggested that it is sometimes necessary to use leading questions with this group. Such statements are worrying, given that an extensive body of research demonstrates that leading questions can impact negatively on recall, especially if interviewees are vulnerable (e.g., Bjorklund, Cassel, Bjorklund, Brown, Park, Ernst, & Owen, 2000). Interestingly, several respondents said that they mould their interviewing techniques to suit the needs of individual witnesses. This approach is particularly helpful given that the cognitive changes associated with advancing age have a unique pattern of progression for each individual (Henrard, 1996). When interviewing any witness, regardless of his or her age, such a flexible, open-minded attitude is an asset.

3.4 – Chapter Summary

This study was the first to examine English police officers' perceptions about older witnesses and to consider some of the reasons for these beliefs. Overall, officers believed older witnesses to be less reliable and less thorough than younger witnesses, which supports findings from mock-juror research. Furthermore, officers shared concerns about interviewing older witnesses, such as minimizing older adults' distress and memory loss, maintaining a witness' attention, and having enough time to conduct interviews. Future research to explore methods for overcoming such difficulties would be valuable. Several officers stated they were insufficiently trained to interview older adults, which indicates that additional training in this area should be seriously considered. However, the recent introduction of Adult Protection officers, whose role is to interview vulnerable adult witnesses, may reduce the need for widespread training initiatives. Interestingly, it was also found that the number of officers who considered the CI to be helpful with older witnesses was roughly equivalent to the number of officers who stated that it was not. The study described in the next chapter will determine whether the CI actually is useful with older adults by comparing the recall elicited by CI interviews with that elicited by typical police interviews.

Chapter IV:

Interviewing younger (17-31-years) and older (60-74-years & 75-95-years) adults with the Cognitive Interview

Older adults represent a substantial group of witnesses and victims[11]. The 2003 British Crime Survey, for example, indicated that 15.2% of all burglary victims and 17.9% of the victims of vehicle-related theft were over the age of 65-years. Furthermore, Study 1 revealed that older witnesses and victims (> 60-years) are regularly encountered by police officers in the United Kingdom. However, older witnesses typically face challenges above and beyond those experienced by young adult witnesses, particularly in terms of their ability to accurately recall events (e.g., Brimacombe et al., 1997; Jacobs et al., 2001). Instead of dismissing older individuals because of potential memory limitations, methods for improving such shortcomings should be identified and tested.

Of the many techniques available for eliciting information from witnesses (e.g., hypnosis, Wagstaff, 1999; conversation management, George & Clifford, 1992; narrative elaboration, Saywitz & Snyder, 1996), the CI has consistently been shown to be the most effective (e.g., Fisher et al., 2002; Holliday, 2003a, b; Köhnken et al., 1999; Milne & Bull, 2002). It may, therefore, prove to be a suitable tool for enhancing the recall of older adults. Indeed, evidence suggests that certain CI mnemonics are particularly helpful for older adults. For example, older adults have been shown to benefit from context reinstatement (Yarmey & Yarmey, 1997). In addition, the CI's emphasis on transferring control to the witness and asking witness compatible questions may be advantageous for older adults, who are thought to have slower processing speeds and a limited pool of cognitive resources (e.g., Anderson & Craik, 2000; Park et al., 1996). The few studies that have examined the CI's use with this group, however, have reported mixed support for its value (McMahon, 2000; Mello & Fisher, 1996; Searcy et al., 2001).

Mello and Fisher (1996) found that an Enhanced CI (ECI) elicited more correct information than a standard police interview, regardless of whether participants were younger (18-35-years) or older (65-80-years). In contrast to other studies about ageing and recall (e.g., Brimacombe et al., 1997; Burke & MacKay,

[11] It is important to note that many victims do not actually witness the crime (e.g., in the case of burglarly).

1997; List, 1986), however, an overall age-related decline in recall was not found. Mello and Fisher (1996) also observed that older adults' performance did not differ when either an ECI or a modified CI (MCI) was used. In Mello and Fisher's (1996) MCI, the *change perspective* mnemonic was removed, participants' opening free-recall was restricted, the pace of the interview was slowed and interviewers ensured that questions were worded simply. McMahon (2000), on the other hand, found that an ECI did not elicit more correct information than a Structured Interview (SI) when tested with young (18-50-years) and older (60-88-years) adults. Unlike Mello and Fisher (1996), however, McMahon (2000) observed an age-related decline in recall, with older adults providing significantly less correct information than young adults. Searcy et al. (2001) found that a MCI in which the *change order* and *change perspective* mnemonics were omitted did not improve younger (18-30-years) or older (62-79-years) participants' recall compared to a SI, although the former age group recalled more correct details.

The design of the present study was based on the work of Mello and Fisher (1996), McMahon (2000), and Searcy et al. (2001). Specifically, it compared the completeness and accuracy of recall elicited by an ECI, MCI and SI across three age groups: young (17-31-years), young-old (60-74-years), and old-old (75-95-years) adults. The MCI tested in this study omitted the *change perspective* mnemonic (cf. Mello & Fisher, 1996; Searcy et al., 2001) because it is sometimes considered to encourage fabrication (e.g., Boon & Noon, 1994), and because older adults have difficulty performing perspective-taking tasks (e.g., Herman & Coyne, 1980; Inagaki et al., 2002). Unlike in Mello and Fisher's (1996) MCI, however, participants in the research reported here were not asked to keep their opening free-recall accounts brief and the interviewer did not exaggerate the slow pace of the ECI, nor use a simplified vocabulary. The witness may perceive such techniques as signs that the interviewer is not interested, or is being patronizing, which may lower participants' confidence and disrupt interviewer-interviewee rapport. Similarly, rather than using a Standard Interview as a control (cf. Mello & Fisher, 1996), the present study used a Structured Interview (cf. McMahon, 2000; Searcy et al., 2001). The techniques employed in the Structured Interview are similar to those recommended for British police interviewers in the *Achieving Best Evidence* document (Home Office, 2001) and enable a direct test of the CI's cognitive components.

This study also addressed some of the limitations inherent in earlier work (e.g., McMahon, 2000; Mello & Fisher, 1996). First, sample size was increased. Second, unlike in Mello and Fisher (1996) older participants were recruited from the community, rather than from a continuing education university course, so were more representative of the general older adult population. Third, because several recent studies have indicated that the memory performance of young-old (60-74-years) and old-old (> 74-years) adults is not consistent across all measures (e.g., Baeckman et al., 1997; Korten et al., 1997), older participants were divided into young-old and old-old groups. Fourth, in addition to obtaining measures of the total correct, incorrect and confabulated information provided by participants (cf. McMahon, 2000; Mello & Fisher, 1996), recall was examined on a qualitative level by categorizing details into distinct types. Specifically, details were classified according to whether they were provided during the free recall phase (in which participants recount their narratives, uninterrupted), or questioning phase (in which the interviewer probes the witness' account with questions) of interviews, and according to whether they reflected information about an Action, Person, Object, or the Surroundings (cf. Akehurst et al., 2003; Holliday, 2003a, b; Memon et al., 1997a; Milne & Bull, 2003). Such information can provide a more precise account of witnesses' recall performance by isolating their strengths and weaknesses for different types of information. Finally, because it has been shown that some older adults experience cognitive decline that could mask the effects of chronological age on recall (e.g., Baeckman et al., 2000), only those who achieved standard / high scores on a test to assess cognitive ability were included in analyses (cf. McMahon, 2000). Specifically, the Mini-Mental State Examination (MMSE), developed by Folstein, Folstein, and McHugh (1975) (see Appendix E), was used to screen participants who displayed signs of cognitive impairment from the sample.

The MMSE is a widely employed clinical aid[12] for evaluating the cognitive status of older (> 60-years) adults. This test consists of 20 questions, takes 5-10 minutes to complete, and is designed to assess orientation, attention, language abilities, immediate and short-term recall, as well as the ability to follow simple verbal and written commands (Crum, Anthony, Bassett, & Folstein, 1993). Test-retest reliability of the MMSE ranges from r = .83 to .98 (Folstein et al., 1975;

[12] Clinical aids are shortened versions of clinical test batteries that can generally be administered by trained non-professionals (Fillenbaum, Heyman, Wilkinson, & Haynes, 1987).

Fillenbaum et al., 1987). Regarding measures of validity, MMSE scores correlate with the verbal (r = .78) and performance (r = .66) scores of Wechsler's (1981) Adult Intelligence Scale (Folstein et al., 1975), as well as with scores on the Blessed Orientation Memory Concentration Test (r = .71, Borenstein, Reisberg, Anand et al., 1985; r = .73, Thal, Grundman, & Golden, 1986; r = .83, Fillenbaum et al., 1987).

A maximum score of 30 can be achieved with the MMSE. The optimal cut-off score for distinguishing between cognitively impaired and non-impaired individuals varies depending on the MMSE's intended use. When employed in clinical studies, cut-off scores of 23 or 24 and below are typically recommended (e.g., Luce, McKeith, Swann, Sarah, & O'Brien, 2001; Tierney, Szalai, Dunn, Geslani, & McDowell, 2000). Other clinical researchers support the use of even stricter cut-offs (e.g., 20, Galasko et al., 1997; 22, Nadler et al., 1995). However, when the MMSE is used as a screening tool to assess the presence of cognitive impairment (e.g., dementia) a cut-off score of 26 is recommended (e.g., Feinberg & Whitlatch, 2001; Kalman, Magloczky, & Janka, 1995; Kukull et al., 1994; Pasqualetti et al., 2002). The present study employed a cut-off score of 26, such that participants who scored below 27 were omitted from subsequent analyses. This cut-off score was selected because the current study was not intended for clinical purposes. Furthermore, it has been shown that although the MMSE is effective at determining the presence and severity of cognitive decline, it is not sensitive enough to diagnose the ultimate causes of the observed impairment. Specifically, cut-off scores of 23 and 24 often result in the misclassification of impaired and non-impaired individuals (Folstein et al., 1975; Tierny et al., 2000; Wind et al., 1997).

Consistent with previous studies comparing young and older adults' recall and with those comparing the memories of young-old (60-74-years) and old-old (> 75-years) individuals (e.g., Brimacombe et al., 1997; Coxon & Valentine, 1997; Korten et al., 1997; Nilsson et al., 1997; Yarmey & Kent, 1980), it was hypothesised that old-old adults (75-95-years) would recall less correct information than young-old adults (60-74-years), who would recall less correct information than young adults (17-31-years). It was also predicted that recall accuracy would decline as participants' ages increased. In accord with earlier CI research (e.g., Köhnken et al., 1999) it was further expected that for each age group, an ECI and MCI would elicit more information than a Structured Interview (SI), with no change in recall accuracy. Specifically, it was predicted that the ECI and MCI would improve the quality and quantity of reported Action, Person, Object, and Surrounding details (Holliday, 2003a, b; Memon et al., 1997b; Milne & Bull, 2003).

4.1 - Method

4.1.1 - Participants

In total, 201 people initially agreed to participate in the present study. Six individuals withdrew consent during the course of testing. Two withdrew because the procedure was taking longer than expected and four failed to remember any details about the video so did not want to be interviewed. Fifty-one of the remaining participants (10 males, 41 females) were 17-31-years-old (M = 19.92, SD = 2.79), 57 (23 males, 34 females) were 60-74-years-old (M = 66.91, SD = 4.01) and 87 (22 males, 65 females) were 75-96-years-old (M = 82.57, SD = 5.19).

Young adults were undergraduate students from the University of Kent who either received course credit for participation or replied to a leaflet (see Appendix F) posted around the university campus. Older adults from both age groups were recruited from local community organizations, social clubs for senior citizens, non-residential day centres, newspaper advertisements, and from leaflets posted around the city of Canterbury and the university campus (see Appendix F). Participants were excluded if they reported vision or hearing difficulties, or if they were unable to read.

Forty-one young-old and old-old participants scored below 27 on the MMSE. These individuals were omitted from the present sample to ensure that the presence of cognitive decline did not obscure the effects of age on recall. Excluded participants were examined separately in Study 4 (Chapter VI). The final sample consisted of 51 (10 males, 41 females) 17-31-year-olds (M = 19.92, SD = 2.79), 52 (21 males, 31 females) 60-74-year-olds (M = 66.98, SD = 4.10) and 51 (8 males, 43 females) 75-95-year-olds (M = 81.78, SD = 4.83). MMSE scores in the young-old group ranged from 27-30 (M = 28.92, SD = 1.01) as did those in the old-old group (M = 28.08, SD = .98).

4.1.2 - Materials

A 2min 40sec film produced by the researcher was used as a stimulus. The video depicted a non-violent attempted car break-in and was rich in quantifiable information, as it was set in a relatively full car park and involved 13 different actors. The video showed several people walking through a car park while 3 young adults examined cars and attempted to break into one. The young adults were interrupted by the owners of the car and ran away (see Appendix G for a complete plot outline). Actors were selected so as to cover a broad age range (i.e., from 5- to 60-years) because it has been found that witnesses are better at remembering individuals from their own age group (Wright & Stroud, 2002). The video was shown on a 14-inch colour television monitor.

Each participant was given one of three interviews (SI, MCI or ECI). The SI was used as a control interview (cf. Holliday, 2003a, b; Memon et al., 1996), and followed the guidelines of Köhnken (1993) and those outlined in *Achieving Best Evidence* (Home Office, 2001). The ECI followed the protocols described by Fisher and Geiselman (1992). Specifically, after a rapport building phase in which neutral issues / events were discussed and the rules of the interview were explained, participants were asked to mentally *reinstate the context* in which they viewed the video and to *report everything* about the video in an uninterrupted narrative. Participants were then asked to recall the video in *reverse order* and to recall the video from the perspective of a different witness. Next, the interviewer asked if there was anything else that participants could remember about the event before proceeding to the questioning phase. In the questioning phase, open-ended questions about topics mentioned in the free recall phase were asked. For each remembered image, participants were asked to mentally recreate the environmental and psychological environment experienced at encoding. When all topics were exhausted, the interviewer again asked if there was anything else that participants could remember about the event. The MCI was identical to the ECI in all respects, except that the *change perspective* technique was omitted from the free recall phase (cf. Holliday, 2003a, b; Holliday & Albon, 2004). The outlines of these interviews are given in Appendix H. Unlike the present study, other researchers (e.g., Memon et al., 1997b; Milne & Bull, 2003) introduce the *change order* and *change perspectives* mnemonics following both an initial free recall attempt (in which participants are asked to *reinstate the context* and *report everything*) and the questioning phase.

4.1.3 - Design

A 3 (age: 17-31 years, 60-74 years, 75-95 years) x 3 (interview: SI, MCI, ECI) factorial design was used. There were 17 participants in each age-interview condition, apart from the 60-74 years SI group which had 18 participants.

4.1.4 – Procedure

4.1.4.1 - Interviewer Training

The researcher conducted all interviews. The *Achieving Best Evidence* document (Home Office, 2001) and Köhnken's (1993) Structured Interview manual were used to prepare for SIs. Fisher and Geiselman's (1992) manual was used to prepare for ECIs and MCIs. The researcher spent 4 hours practising the different interviewing techniques with another trained interviewer and conducted 12 practice interviews (4 of each type) with volunteers from a local residential home for older adults. After each practice interview was performed it was evaluated and discussed with the trained interviewer.

4.1.4.2 - Participant Testing

All participants were tested individually. Approximately equal numbers of males and females from each age group were assigned to one of the three interview conditions. Prior to showing the video, the researcher explained the nature of the study and asked participants to read an information sheet (see Appendix I). Following verbal consent, each participant signed a consent form (see Appendix I). To ensure that participants were not distressed by any of the events depicted in the video, they were informed that the film was staged and that it was about a non-violent crime. Participants were treated according to the American Psychological Association's ethical guidelines (2001). Participants were seated approximately three feet from the screen and were informed that they would later be asked to describe what they had seen (cf. McMahon, 2000).

The researcher made a special point of announcing that she had not seen the film and explained that this restriction was an experimental control designed to prevent her from 'leaking' information about the video during the subsequent interview phase and thereby influencing participants' accounts. While the film was playing the researcher stood outside the testing room with the door closed. This ensured that the researcher was more effective in *transferring control* (Fisher & Geiselman, 1992; Smith & Ellsworth, 1987) to the participant during the course of the subsequent interview. *Transfer of control* is accomplished when the investigator indicates that s/he knows nothing about the event in question and reinforces that the interviewee, rather than the interviewer, is the expert on what happened (Fisher & Geiselman, 1992; Smith & Ellsworth, 1987).

After viewing the video, each participant conversed with the interviewer for 30 minutes (cf. McMahon, 2000; Mello & Fisher, 1996). The contents of the video were not discussed. Instead, conversations generally centred on the interests of the participant and current world events.

Interviews occurred in the same location as video viewing because only one room was available for research purposes at any given time. In order to reduce any memory-enhancing effects of physical context reinstatement that might negate the mental context reinstatement component of the MCI or ECI, the researcher altered the environment by repositioning participants to face the opposite wall and by opening the window blinds. Time limits were not imposed on any of the interviews; instead, interviews were terminated when participants gave a negative response to the question "is there anything else you can remember?"

The MMSE (Folstein et al., 1975) was administered to young-old and old-old participants after a 2-5min break that followed the interview. The MMSE was not administered to young adult participants because it was assumed that this group would be highly unlikely to present the symptoms of cognitive decline that the MMSE was designed to expose. All participants were then debriefed and thanked.

4.2.4.3 - Interview Coding

All interviews were audio-taped and subsequently transcribed by the researcher and three assistants (see Appendix J for an example of a transcribed interview). Transcripts were edited of all information that might identify participants and were then scored by the researcher. A second independent rater scored a total of 24 interviews – 6 of these (2 SI, 2 MCI, 2 ECI) were from the young adult group, 6 (2 SI, 2 MCI, 2 ECI) were from the young-old group and 12 (4 SI, 4 MCI, 4 ECI) were from the old-old group. Inter-rater reliability was conducted on the interviews of old-old adults who scored both high (>26) and low (0-26) on the MMSE. In total, 6 of the interviews (2 SI, 2 MCI, 2 ECI) examined were conducted with those who scored high on the MMSE and 6 (2 SI, 2 MCI, 2 ECI) were conducted with those who scored low on the MMSE. The recall of individuals with low and high MMSE scores will not be compared until Chapter VI (Study 4). Finally, a different independent assistant listened to 15 interviews (5 SI, 5 MCI, 5 ECI) from each age category (45 interviews in total) to ensure that the transcripts were not discrepant from the commentary on the tapes.

Participants' responses were coded and scored using a technique based on the work of Memon et al. (1996, 1997a, b; also see Holliday, 2003a, b). The film stimulus was independently written up in template form by the researcher and an assistant who was unaware of the nature of the study. Each piece of information in the video was identified as a discrete, single unit, and classified as an Action (A), Person (P), Object (O) or Surrounding (S) detail. For example, a video sequence about "a girl wearing a skirt and pushing a green bike across the car park" was coded as follows: "girl (1-P) with skirt (1-P) pushed (1-A) green (1-O) bike (1-O) across car park (1-S)" (see Appendix K). The resulting templates were compared and a summary template, reflecting the agreement between the two individuals, was constructed. If a participant mentioned a detail that was not listed on the summary template the researcher viewed the video to confirm or disconfirm the detail's presence. When a detail was confirmed it was added to the summary template (see Appendix L for the final template). In total, this template contained 699 pieces of information: 121 action details, 387 person details, 81 object details, and 110 details about the surroundings.

Interview transcripts were also re-written in template form such that the templates consisted only of information that was relevant to the video (e.g., a digression about crime in society not added to the interview template). Responses that were subjective (e.g., "her dress was ugly"), or excessively vague (e.g., using the terms 'he' or 'it' when the context was such that they could refer to any number of people or things) were also excluded from the interview template (cf. Geiselman et al., 1986; Memon et al., 1994, 1995).

There is scant information about whether it is appropriate to score responses that express uncertainty (e.g., "They *may* have smashed a window to get in, I'm not entirely sure though"). For the purpose of the present study, and consistent with earlier work by Memon and colleagues (1994; 1995), such responses were assigned to a separate category, *uncertain responses*. This decision was commensurate with the instructions given at the beginning of each interview that ask participants not to guess at information (Fisher & Geiselman, 1992; Köhnken et al., 1993). If a participant repeated a detail during the course of the interview it was only scored the first time it was mentioned. Furthermore, if a participant changed a response only the final response was considered (cf. McMahon, 2000). As in the summary template, each piece of relevant information mentioned during the course of an interview was classified as a Person, Action, Object or Surrounding detail (see Appendix M for an example interview presented in template form).

Next, the details in each interview template were scored for accuracy. An item was considered to be correct if it precisely matched the video, and incorrect if it was discrepant from the video (e.g., *pink* car instead of *blue* car). Following Gudjonsson (1992) and McMahon (2000), details were scored as confabulations if they were not present in the film (e.g., "a policeman arrived to help the car owners"). Details were also classified as to whether they were reported in the free recall or questioning phase of interviews (cf. Memon et al., 1997a, b).

A measure of inter-rater reliability was calculated for the total number of correct, incorrect, and confabulated details. The resulting Pearson's correlations of the two raters' scores for these items were: $r_{correct} = .90, p < .001$; $r_{incorrect} = .82, p < .001$; and $r_{confabulated} = .89$, $p < .001$. Inter-rater reliability for the total number of correct, incorrect and confabulated *uncertain responses* was found to be $r_{correct} = .92$, $p < .001$; $r_{incorrect} = .82, p < .001$; and $r_{confabulated} = .86, p < .001$, respectively.

4.2 - Results

4.2.1 - Interview Quality

To determine whether the quality of interviews was similar across each condition an independent rater selected three interviews from each condition, such that an equal number of interviews had been conducted at the beginning, middle and end of the interviewing period (i.e., 27 interviews). Working from both transcripts and audio-tapes, the rater was asked to examine interviews for the presence or absence of 7 features that enhance the social dynamics of an interview: Uses supportive listening; uses appropriate vocabulary; asks questions that are witness compatible; does not interrupt the witness; does not ask multiple questions; does not ask leading or misleading questions; and does not re-ask a question (see Appendix N; Milne & Bull, 1999; Wright & Alison, in press). For each interview, a summary measure, *Technique Quality*, was calculated to reflect the total number of features present in that interview (i.e., a Technique Quality score of 5 was assigned if 5 of the 7 features listed above were present). A univariate analysis of variance (ANOVA) was performed to determine whether Technique Quality scores were influenced by interview type or age. No significant differences were found between the mean Technique Quality scores in SI ($M = 6.11$, $SD = 1.05$), MCI ($M = 6.56$, $SD = .73$) or

ECI ($M = 6.33$, $SD = .71$) conditions, $F(2, 18) = .55$, $MSE = .82$, $p = .59$. Similarly, there were no significant differences, $F(1, 18) = .14$, $MSE = .82$, $p = .87$, between the mean scores of young ($M = 6.33$, $SD = 1.00$), young-old ($M = 6.22$, $SD = .83$), and old-old ($M = 6.44$, $SD = .72$) adults. Recall was not an artefact of Technique Quality, hence this variable was excluded from subsequent analyses.

Next, the rater scored the same set of interviews along a Likert scale of 1 (*not at all present*) to 7 (*very good*) for the following measures: Interviewer Polite; Interviewer Friendly; Interview Not Rushed; and Overall Rapport Between Interviewer and Interviewee (see Appendix N). For each interview, a measure of Social Quality was calculated by averaging the scores of the Polite, Friendly, Not Rushed and Overall Rapport measures. A univariate ANOVA was performed to determine whether Social Quality scores were influenced by interview type or age. No significant differences were found between the mean Social Quality scores in SI ($M = 5.72$, $SD = .71$), MCI ($M = 5.67$, $SD = .87$), or ECI ($M = 5.69$, $SD = .65$) conditions, $F(2, 18) = .01$, $MSE = .73$, $p = .99$. Similarly, there were no significant differences between the mean scores of young ($M = 5.58$, $SD = .80$), young-old ($M = 5.81$, $SD = .66$), and old-old ($M = 5.69$, $SD = .77$) participants, $F(1, 18) = .15$, $MSE = .73$, $p = .86$. Recall was not an artefact of Social Quality, hence this variable was excluded from further analyses.

Finally, the rater was asked to ensure that each ECI, MCI and SI contained the appropriate instructions and questions (described in Appendix H). All interviews met the required criteria.

4.2.2 – Gender, Interview Duration and Number of Questions Asked

Preliminary analyses revealed no significant gender differences in the total number of correct, incorrect, or confabulated details reported. Similarly, there were no significant gender differences in the completeness or accuracy of recall (all F's < 1.81, all p's > .18)[13]. Consequently, the results presented are collapsed across gender.

The interviewer was not masked to the experimental hypotheses. It is possible, therefore, that the observed differences in the amount and accuracy of information recalled in each condition were influenced by her expectations. Hayes and Delamothe (1997) suggested that such expectations could result in systematic differences in the length of interviews, or in the number of questions asked in

[13] Statistics relating to the non-significant results of this study are presented in Appendix O.

interviews. Consequently, interview duration and the number of questions asked in each interview were determined (cf. Holliday, 2003a, b). Two separate univariate ANOVAs were conducted to examine the effects of age and interview type on *interview duration* and *number of questions.*

Interview duration was defined as the total amount of time (in minutes) that the researcher spent interviewing each participant. Interview duration was measured from the end of the rapport-building phase to the end of the interview, and excluded time spent on cognitive instructions (cf. McMahon, 2000). Questions were considered to be specific probes for information (e.g., "did you notice what she was wearing?"), and did not include the initial introduction of a new topic area (e.g., in the case of an SI, "you mentioned a girl pushing a bike... can you tell me anything more about her?"). If a participant did not hear or understand a question properly, so that it had to be posed again, only the first instance of the question was counted. However, if the researcher mistakenly asked the same question twice during the course of an interview, both instances were scored.

Interview duration. Significant main effects were found for both age, F (2, 145) = 32.56, MSE = 49.27, η_p^2 = .31, p < .01, and interview type, F (2, 145) = 8.71, MSE = 49.27, η_p^2 = .11, p < .01. Tukey's Honestly Significant Difference (HSD) Test was used to make post-hoc pairwise comparisons. This test counteracts the inflation of Type I (familywise) error rate that is caused by making too many comparisons and is therefore considered to be one of the more conservative and powerful post hoc procedures (Howell, 1997). Throughout this thesis, the probability of making a Type I error was set at .05. Tukey's HSD tests revealed that interviews with old-old adults were shorter (M = 18.23 min, SD = 5.26) than those with young adults (M = 24.27 min, SD = 6.97), which in turn were shorter than interviews with young-old adults (M = 29.38 min, SD = 9.28). Regarding interview type, SIs were shorter (M = 21.13 min, SD = 7.14) than MCIs (M = 24.07 min, SD = 9.36), which were shorter than ECIs (M = 26.79 min, SD = 8.45).

Number of questions. Main effects were observed for age, F (2, 145) = 10.90, MSE = 56.22, η_p^2 = .131, p < .01, and interview type, F (2, 145) = 3.47, MSE = 56.22, η_p^2 = .05, p < .05). Tukey's HSD revealed that fewer questions were asked of young adults (M = 19.24, SD = 7.33) than of young-old adults (M = 25.00, SD = 8.59), or old-old adults (M = 25.47, SD = 6.63). Moreover, fewer questions were asked in ECIs (M = 21.16, SD = 7.50) than in MCIs (M = 23.49, SD = 8.05), or SIs (M = 25.06, SD = 8.20).

Are interview duration and question number covariates of recall? It is possible that superior recall was obtained in certain conditions because of the length of interviews or the number of questions asked in those groups. Consequently, analyses were performed to determine whether interview duration and question number should be included as covariates in all subsequent calculations. Six 3 (age) x 3 (interview) ANCOVAs, using *interview duration* and *number of questions* as covariates, were conducted on the total number of correct, incorrect, and confablated details reported across the entire interview. A significant effect of *interview duration* was found for the total number of correct, $F(1, 143) = 71.65$, $MSE = 1181.86$, $\eta_p^2 = .33$, $p < .001$, incorrect, $F(1, 143) = 22.04$, $MSE = 50.57$, $\eta_p^2 = .13$, $p < .001$, and confabulated, $F(1, 143) = 6.95$, $MSE = 17.17$, $\eta_p^2 = .05$, $p < .01$, details recalled. Significant effects of *question number* were not observed for the total number of correct, $F(1, 143) = .63$, $MSE = 1181.86$, $p = .43$, incorrect, $F(1, 143) = .90$, $MSE = 50.57$, $p = .35$, or confabulated, $F(1, 143) = .67$, $MSE = 17.17$, $p = .41$, details recalled. *Interview duration*, but not *question number*, was therefore included as a covariate in all further analyses. When a covariate is present, significant differences among the treatment means can only be determined after the effect of the covariate has been partialled out of the analysis (Howell, 1997). Means adjusted for the effects of the covariate (i.e., estimated marginal means) are used to interpret significant differences between conditions (Green, Salkind, & Akey, 2000; Howell, 1997). Throughout this chapter, the effects of age and interview on recall were determined using means that were adjusted to account for the effect of *interview duration*. The unadjusted means for all analyses are shown in Appendix P.

4.2.3 – Recall Across Interview Phases

The adjusted mean numbers of correct, incorrect and confabulated details reported by participants across both interview phases are shown in Table 4.1. A series of 3 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were conducted to examine the total amount of correct information reported across both interview phases, and to examine participants' recall of Action, Person, Object, and Surrounding details. Significant interactions were examined using Tukey's HSD post hoc tests.

Table 4.1

Adjusted mean number of correct, incorrect and confabulated details recalled across interview phases, as a function of age and interview (standard errors in brackets)

	Age			Interview		
	Young	Young-old	Old-old	SI	MCI	ECI
Correct						
Action	33.31 (1.18)	32.58 (1.29)	28.45 (1.32)	27.18 (1.21)	32.71 (1.18)	34.45 (1.22)
Person	107.50 (2.79)	80.56 (3.05)	65.68 (3.10)	74.62 (2.85)	87.55 (2.79)	91.58 (2.87)
Object	21.96 (0.90)	20.71 (0.98)	16.63 (0.99)	17.02 (0.92)	19.75 (0.90)	22.53 (0.92)
Surround	20.72 (1.14)	21.81 (1.24)	16.56 (1.27)	15.91 (1.16)	18.52 (1.14)	24.67 (1.17)
Total	183.27 (4.81)	155.75 (5.25)	127.36 (5.35)	134.68 (4.91)	158.67 (4.81)	173.04 (4.94)
Incorrect						
Action	0.78 (0.19)	1.77 (0.21)	0.98 (0.22)	1.10 (0.20)	1.21 (0.19)	1.21 (0.20)
Person	11.48 (0.84)	12.94 (0.91)	11.78 (0.93)	13.16 (0.85)	12.97 (0.84)	10.07 (0.86)
Object	0.83 (0.19)	1.65 (0.20)	1.98 (0.21)	1.56 (0.19)	1.47 (0.19)	1.43 (0.19)
Surround	1.60 (0.19)	1.80 (0.20)	1.71 (0.21)	1.60 (0.19)	1.62 (0.19)	1.88 (0.19)
Total	14.67 (1.00)	18.17 (1.09)	16.45 (1.11)	17.39 (1.02)	17.30 (1.00)	14.59 (1.02)
Confabulated						
Action	0.17 (0.16)	0.64 (0.17)	0.38 (0.17)	0.77 (0.16)	0.25 (0.16)	0.17 (0.16)
Person	1.09 (0.40)	1.65 (0.44)	1.70 (0.44)	2.07 (0.41)	1.09 (0.40)	1.28 (0.41)
Object	0.29 (0.13)	0.41 (0.14)	0.42 (0.14)	0.61 (0.13)	0.27 (0.13)	0.24 (0.13)
Surround	0.35 (0.08)	0.24 (0.09)	0.21 (0.09)	0.33 (0.09)	0.24 (0.08)	0.23 (0.09)
Total	1.90 (0.58)	2.94 (0.63)	2.70 (0.64)	3.78 (0.59)	1.85 (0.58)	1.92 (0.60)

Correct details.

Age Effects: For the total number of correct details recalled, a main effect was found for age, F (2, 143) = 30.68, MSE = 1178.78, $\eta_p{}^2 = .30, p < .001$, with young adults recalling more correct information (M = 183.27) than young-old adults (M = 155.75), who recalled more correct information than old-old adults (M = 127.36). Main effects of age were also found for correct Action, F (2, 143) = 3.90, MSE = 71.38, $\eta_p{}^2 = .05, p < .05$, Person, F (2, 143) = 54.95, MSE = 397.25, $\eta_p{}^2 = .43, p < .001$, Object, F (2, 143) = 7.90, MSE = 41.16, $\eta_p{}^2 = .10, p < .01$, and Surrounding details, F (2, 143) = 4.26, MSE = 66.13, $\eta_p{}^2 = .06, p < .05$. Young adults ($M_{action}$ = 33.31, M_{object} = 21.96, $M_{surrounding}$ = 20.72) and young-old adults (M_{action} = 32.58, M_{object} = 20.71, $M_{surrounding}$ = 21.81) recalled more correct Action, Object, and Surrounding details than old-old adults (M_{action} = 28.45, M_{object} = 16.63, $M_{surrounding}$ = 16.56). Young adults also recalled more correct Person details (M = 107.50) than young-old adults (M = 80.56), who recalled more correct Person details than old-old adults (M = 65.68).

Interview Effects: When the total number of correct details elicited across the entire interview was considered, a main effect of interview type was found, F (2, 143) = 14.69, MSE = 1178.78, $\eta_p{}^2 = .17, p < .001$. Those in the ECI condition recalled more correct information (M = 173.04) than those in the MCI condition (M = 158.67), who recalled more correct information than participants in the SI condition (M = 134.68). A main effect of interview type was found for the number of correct Action, F (2, 143) = 9.63, MSE = 71.38, $\eta_p{}^2 = .12, p < .001$, Person, F (2, 143) = 9.18, MSE = 397.25, $\eta_p{}^2 = .11, p < .001$, Object, F (2, 143) = 8.48, MSE = 41.16, $\eta_p{}^2 = .11, p < .001$, and Surrounding, F (2, 143) = 14.12, MSE = 66.13, $\eta_p{}^2 = .16, p < .001$, details reported. The MCI (M_{action} = 32.71, M_{person} = 87.55) and ECI (M_{action} = 34.45, M_{person} = 91.58) elicited more correct Action and Person details than the SI (M_{action} = 27.18, M_{person} = 74.62). The ECI also elicited more correct Object and Surrounding details (M_{object} = 22.53, $M_{surrounding}$ = 24.67) than the MCI (M_{object} = 19.75, $M_{surrounding}$ = 18.52), which elicited more correct Object and Surrounding details than the SI (M_{object} = 17.02, $M_{surrounding}$ = 15.91).

No Interaction effects were observed (all F's < 1.38, all p's > .24).

Incorrect Details.

Age Effects: No main effect of age was found for the total number of incorrect details recalled across the entire interview, F (2, 143) = 2.19, MSE = 50.54, p = .08. In terms of specific detail types, a main effect of age was observed for the number of incorrect Action, F (2, 143) = 6.24, MSE = 1.90, η_p^2 = .08, p < .01, and Object, F (2, 143) = 9.67, MSE = 1.78, η_p^2 = .12, p < .01, details reported. Young-old adults recalled more incorrect Action details (M = 1.77) than either young adults (M = .78), or old-old adults (M = .98). Both young-old (M = 1.65) and old-old (M = 1.98) adults recalled more incorrect Object details than young adults (M = .83). No other main effects of age were found (all F's < .72, all p's > .49).

Interview Effects: Although no effect of interview was found for the total number of incorrect details recalled across the entire interview, F (2, 143) = 2.35, MSE = 50.54, p = .10, a main effect of interview on the number of incorrect Person details was found, F (2, 143) = 3.95, MSE = 35.62, η_p^2 = .05, p < .05. Individuals given the ECI reported fewer incorrect Person details (M = 10.07) than those given the MCI (M = 12.97), or SI (M = 13.16). No other main effects of interview type were found (all F's < .61, all p's > .55).

No interaction effects were observed (all F's < 1.39, all p's > .24).

Confabulated details.

Age Effects: No main effects of age were found for the total number of confabulated details recalled across the entire interview, F (2, 143) = .89, MSE = 17.13, p = .42. Similarly, no age effects were observed with respect to specific detail types (all F's < 2.19, all p's > .12).

Interview Effects: A significant main effect of interview type was found for the total number of confabulated details recalled, F (2, 143) = 3.30, MSE = 17.13, η_p^2 = .04, p = .04. The SI elicited more confabulated information (M = 3.78) than either the MCI (M = 1.85) or ECI (M = 1.92). In addition, there was a main effect of interview type on the number of confabulated Action details reported, F (2, 143) = 4.03, MSE = 1.23, η_p^2 = .05, p < .05, with SIs eliciting more confabulated Action details (M = .77) than either MCIs (M = .25) or ECIs (M = .17). No other effects of interview type were observed (all F's < 2.29, all p's > .11).

No interaction effects were were observed (all F's < 2.03, all p's > .09).

4.2.4 - Free Recall Phase

The adjusted mean numbers of correct, incorrect and confabulated details reported in the free recall phase of interviews are illustrated in Table 4.2. A series of 3 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were conducted to examine the total amount of correct, incorrect and confabulated information reported in the free recall phase and to examine participants' recall of Action, Person, Object, and Surrounding details. Significant interactions were examined using Tukey's HSD tests.

Table 4.2

*Adjusted mean number of correct, incorrect and confabulated details recalled in the **free recall** phase, as a function of age and interview (standard errors in brackets)*

	Age			Interview		
	Young	Young-old	Old-old	SI	MCI	ECI
Correct						
Action	26.05 (0.95)	25.01 (1.04)	20.56 (1.06)	18.22 (0.98)	25.99 (0.95)	27.41 (0.98)
Person	54.95 (1.97)	43.63 (2.15)	32.71 (2.19)	35.14 (2.01)	46.28 (1.97)	49.87 (2.03)
Object	13.94 (0.65)	14.05 (0.71)	10.33 (0.72)	9.62 (0.66)	13.58 (0.65)	15.11 (0.67)
Surround	7.43 (0.77)	9.37 (0.84)	6.65 (0.86)	4.88 (0.79)	7.25 (0.77)	11.33 (0.80)
Total	102.36 (3.56)	91.58 (3.88)	70.56 (3.95)	67.96 (3.63)	93.22 (3.56)	103.33 (3.66)
Incorrect						
Action	0.45 (0.15)	1.20 (0.16)	0.49 (0.17)	0.40 (0.15)	0.86 (0.15)	0.88 (0.15)
Person	2.73 (0.30)	2.51 (0.33)	2.55 (0.34)	2.61 (0.31)	2.81 (0.30)	2.37 (0.31)
Object	0.17 (0.08)	0.55 (0.09)	0.35 (0.09)	0.22 (0.08)	0.49 (0.08)	0.36 (0.09)
Surround	0.42 (0.14)	0.50 (0.15)	0.68 (0.15)	0.36 (0.14)	0.35 (0.14)	0.89 (0.14)
Total	3.60 (0.46)	4.81 (0.49)	4.03 (0.51)	3.55 (0.46)	4.51 (0.46)	4.38 (0.47)
Confabulated						
Action	0.09 (0.08)	0.22 (0.08)	0.22 (0.09)	0.30 (0.08)	0.20 (0.08)	0.05 (0.08)
Person	0.40 (0.14)	0.45 (0.15)	0.68 (0.16)	0.71 (0.14)	0.55 (0.14)	0.27 (0.14)
Object	0.16 (0.06)	0.10 (0.06)	0.17 (0.07)	0.20(0.06)	0.10 (0.06)	0.12 (0.06)
Surround	0.07 (0.04)	0.07 (0.05)	0.13 (0.05)	0.05 (0.04)	0.08 (0.05)	0.09 (0.05)
Total	0.67 (0.23)	0.84 (0.25)	1.21 (0.25)	1.27 (0.23)	0.92 (0.23)	0.53 (0.21)

Correct details.

Age Effects: A main effect of age was found for the total number of correct details recalled, F (2, 143) = 17.68, MSE = 645.14, η_p^2 = .20, p < .001. Young adults recalled more correct information (M = 102.36) than young-old adults (M = 91.58), who recalled more correct information than old-old adults (M = 70.56). A main effect of age was also found for correct Action, F (2, 143) = 7.53, MSE = 46.43, η_p^2 = .10, p < .01, Person, F (2, 143) = 29.07, MSE = 198.04, η_p^2 = .29, p < .001, and Object, F (2, 143) = 8.01, MSE = 21.48, η_p^2 = .10, p < .01, details. Old-old adults reported fewer correct Action and Object details (M_{action} = 20.56, M_{object} = 10.33) than either young adults (M_{action} = 26.05, M_{object} = 13.94), or young-old adults (M_{action} = 25.01, M_{object} = 14.05). Young adults recalled more correct Person details (M = 54.95) than young-old adults (M = 43.63), who recalled more correct Person details than old-old adults (M = 32.71). A significant effect of age was not found for Surrounding details, F (2, 143) = 2.38, MSE = 30.50, p = .10.

Interview Effects: For the total number of correct details, a main effect was found for interview type, F (2, 143) = 23.82, MSE = 645.14, η_p^2 = .25, p < .001. More correct details were elicited from ECIs (M = 103.33) than MCIs (M = 93.22). In turn, MCIs elicited more correct information than SIs (M = 67.96). A main effect of interview type on the number of correct Action, F (2, 143) = 24.62, MSE = 46.43, η_p^2 = .26, p < .001, Person, F (2, 143) = 13.83, MSE = 198.04, η_p^2 = .16, p < .001, Object, F (2, 143) = 17.29, MSE = 21.48, η_p^2 = .10, p < .001, and Surrounding, F (2, 143) = 16.08, MSE = 30.50, η_p^2 = .18, p < .001, details was also observed. For Action and Person details, the ECI (M_{action} = 27.41, M_{person} = 49.87) and MCI (M_{action} = 25.99, M_{person} = 46.28) resulted in more correct information than the SI (M_{action} = 18.22, M_{person} = 35.14,). More Surrounding and Object details were elicited in the ECI ($M_{\text{surrounding}}$ = 11.33, M_{object} = 15.11) than in the MCI ($M_{\text{surrounding}}$ = 7.25, M_{object} = 13.58). Similarly, the MCI elicited more correct Surrounding and Object details than the SI ($M_{\text{surrounding}}$ = 4.88, M_{object} = 9.62).

No interaction effects were observed (all F's < 1.30, all p's > .27).

Incorrect details.

Age Effects: For the total number of incorrect details, no significant main effect was found for age, F (2, 143) = 1.64, MSE = 10.54, p = .20. However, main effects of age were observed for the number of incorrect Action, F (2, 143) = 6.56, MSE = 1.12, $\eta_p^2 = .08, p < .01$, and Object, F (2, 143) = 4.99, MSE = .35, $\eta_p^2 = .07$, $p < .05$, details recalled. Young-old adults reported more incorrect Action details (M = 1.20) than either young adults (M = .45), or old-old adults (M = .49). Young-old adults also reported more incorrect Object details (M = .55) than old-old adults (M = .35), who reported more incorrect Object details than young adults (M = .17). No effects of age were found for the number of incorrect Person, or Surrounding details reported (all F's < .80, all p's > .45).

Interview Effects: No significant main effect of interview was observed for the total number of incorrect details reported, F (2, 143) = 1.26, MSE = 10.54, p = .29. However, main effects of interview type were observed for the number of incorrect Action, F (2, 143) = 3.13, MSE = 1.12, $\eta_p^2 = .04, p < .05$, and Surrounding, F (2, 143) = 4.81, MSE = .97, $\eta_p^2 = .06, p < .05$, details reported. SIs elicited fewer incorrect Action details (M = .40) than either MCIs (M = .86) or ECIs (M = .88). As well, SIs (M = .36) and MCIs (M = .35) elicited fewer incorrect Surrounding details than ECIs (M = .89). No other effects of interview were observed (all F's < 2.52, all p's > .08).

No interaction effects were observed (all F's < 1.68, all p's > .16).

Confabulated details.

No main effects of age (all F's < 1.65, all p's > .20) or interview (all F's < 2.42, all p's > .09) were found. Similarly, no interaction effects were observed (all F's < 1.51, all p's > .20).

4.2.5 - Questioning Phase

The adjusted mean numbers of correct, incorrect and confabulated details reported in the questioning phase of interviews are presented in Table 4.3. Several 3 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were performed to examine the total amount of correct, incorrect and confabulated information reported, and the amount of correct, incorrect and confabulated Action, Person, Object and Surrounding details reported. Tukey's HSD tests were used to examine significant interactions.

Table 4.3

Adjusted mean number of correct, incorrect and confabulated details recalled in the questioning phase, as a function of age and interview (standard errors in brackets)

	Age			Interview		
	Young	Young-old	Old-old	SI	MCI	ECI
Correct						
Action	7.32 (0.77)	7.55 (0.84)	7.91 (0.86)	8.97 (0.79)	6.77 (0.77)	7.03 (0.79)
Person	52.56 (1.85)	36.93 (2.02)	32.99 (2.06)	39.48 (1.89)	41.28 (1.85)	41.73 (1.90)
Object	8.02 (0.52)	6.66 (0.57)	6.31 (0.58)	7.40 (0.53)	6.16 (0.52)	7.42 (0.54)
Surround	13.29 (0.79)	12.44 (0.86)	9.93 (0.87)	11.03 (0.80)	11.28 (0.79)	13.36 (0.81)
Total	80.95 (3.04)	63.74 (3.32)	59.03 (3.38)	66.82 (3.11)	65.51 (3.04)	69.39 (3.13)
Incorrect						
Action	0.33 (0.10)	0.57 (0.13)	0.49 (0.12)	0.70 (0.11)	0.35 (0.10)	0.33 (0.11)
Person	8.73 (0.76)	10.42 (0.82)	9.29 (0.84)	10.53 (0.77)	10.16 (0.76)	7.76 (0.78)
Object	0.68 (0.17)	1.10 (0.18)	1.59 (0.18)	1.37 (0.17)	0.98 (0.17)	1.03 (0.17)
Surround	1.33 (0.17)	1.27 (0.18)	1.04 (0.18)	1.26 (0.17)	1.29 (0.16)	1.08 (0.17)
Total	10.89 (0.86)	13.34 (0.94)	12.41 (0.95)	13.66 (0.88)	12.78 (0.86)	10.19 (0.88)
Confabulated						
Action	0.05 (0.12)	0.43 (0.13)	0.15 (0.13)	0.47 (0.12)	0.06 (0.12)	0.10 (0.12)
Person	0.67 (0.31)	1.21 (0.34)	1.01 (0.34)	1.35 (0.32)	0.55 (0.31)	1.00 (0.32)
Object	0.18 (0.10)	0.30 (0.11)	0.26 (0.11)	0.41 (0.10)	0.18 (0.10)	0.15 (0.10)
Surround	0.33 (0.08)	0.17 (0.08)	0.08 (0.08)	0.29 (0.08)	0.16 (0.08)	0.14 (0.08)
Total	1.24 (0.45)	2.11 (0.49)	1.50 (0.50)	2.51 (0.46)	0.94 (0.45)	1.39 (0.46)

Correct details.

Age Effects: A main effect of age was found for the total number of correct details recalled, F (2, 143) = 15.98, MSE = 471.45, η_p^2 = .18, p < .001. Young adults recalled more correct information (M = 80.95) than young-old adults (M = 63.74), and old-old adults (M = 59.03). Main effects of age were observed for Person, F (2, 143) = 30.80, MSE = 174.48, η_p^2 = .30, p < .001, and Surrounding, F (2, 143) = 4.10, MSE = 31.49, η_p^2 = .05, p < .05, details. A marginally significant[14] main effect was found for Object details, F (2, 143) = 2.94, MSE = 13.93, η_p^2 = .04, p = .06. Young adults reported more correct Person details (M = 52.56) than young-old adults (M = 36.93), who reported more correct Person details than old-old adults (M = 32.99). Young adults recalled more correct Object details (M = 8.02) than young-old (M = 6.66) or old-old (M = 6.31) adults. Young (M = 13.29) and young-old (M = 12.44) adults reported more Surrounding details than old-old adults (M = 9.93). No main effect of age was found for correct Action details, F (2, 143) = .13, MSE = 30.39, p = .88.

Interview Effects: No significant effects of interview were observed (all F's < 2.43, all p's > .09).

No interaction effects were observed (all F's < 1.01, all p's > .41).

Incorrect details.

Age Effects: A main effect of age was observed for the number of incorrect Object details recalled, F (2, 143) = 6.67, MSE = 1.40, η_p^2 = .09, p < .01. Young participants recalled fewer incorrect Object details (M = .68) than young-old participants (M = 1.10), who recalled fewer incorrect Object details than old-old participants (M = 1.59). No other age effects were found (all F's < 2.06, all p's > .13).

Interview Effects: A significant main effect of interview type was found for the total number of incorrect details recalled, F (2, 143) = 4.01, MSE = 37.53, η_p^2 = .05, p < .05. Participants in the SI (M = 13.66) and MCI (M = 12.78) conditions reported more incorrect information than those in the ECI condition (M = 10.19). In addition, a main effect of interview type was found for the number of Action details recalled, F (2, 143) = 3.73, MSE = .55, η_p^2 = .05, p < .05. The SI elicited more

[14] p-values from .05 to .06 were considered marginally significant (cf. Holliday, 2003b).

incorrect Action details ($M = .70$) than the MCI ($M = .35$) or ECI ($M = .33$). A main effect was also found for the number of incorrect Person details recalled, $F(2, 143) = 3.63$, $MSE = 29.13$, $\eta_p^2 = .05$, $p < .05$, such that the ECI resulted in fewer incorrect details ($M = 7.76$) than either the SI ($M = 10.53$) or MCI ($M = 10.16$). No other effects of interview type were found (all F's < 1.43, all p's > .24).

No significant interaction effects were observed (all F's < .89, all p's > .47).

Confabulated details.

Age Effects: A marginally significant main effect of age was observed for the number of Surrounding details reported, $F(2, 143) = 2.85$, $MSE = .30$, $\eta_p^2 = .06$, $p = .06$. Young adults recalled more confabulated Surrounding details ($M = .33$) than old-old adults ($M = .08$). No other age effects were found (all F's < 2.30, all p's > .10).

Interview Effects: A marginally significant main effect of interview type was found for the total number of confabulated details recalled, $F(2, 143) = 3.14$, $MSE = 10.19$, $\eta_p^2 = .04$, $p = .05$, such that the MCI elicited fewer confabulated details ($M = .94$) than the SI ($M = 2.51$). A main effect of interview was found for confabulated Action details, $F(2, 143) = 3.29$, $MSE = .72$, $\eta_p^2 = .04$, $p < .05$. The SI elicited more confabulated Action details ($M = .47$) than either the MCI ($M = .06$) or ECI ($M = .10$). There were no effects of interview on the number of confabulated Person, Object, or Surrounding details reported (all F's < 1.75, all p's > .18).

No interaction effects were observed (all F's < 1.99, all p's > .10).

4.2.6 –Uncertain Responses

Across both interview phases, the adjusted mean numbers of correct, incorrect and confabulated details that participants mentioned but, expressed uncertainty about, were determined. These are shown in Table 4.4. A series of 3 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were conducted to examine the total amount of correct information reported across and within interview phases. A similar series of ANCOVAs were used to examine recall of Action, Person, Object, and Surrounding details. Tukey's HSD post hoc tests were used to investigate significant interactions. Across the entire interview, and in each interview phase, no significant differences were found in the number of uncertain correct, incorrect, or confabulated details reported as a function of age or interview (all F's < 1.82, all p's > .17).

Table 4.4

Adjusted mean number of correct, incorrect and confabulated details recalled with ***uncertainty****, as a function of age and interview (standard errors in brackets)*

	Age			Interview		
	Young	Young-old	Old-old	SI	MCI	ECI
FR Phase						
Correct	0.23 (0.07)	0.08 (0.07)	0.24 (0.07)	0.15 (0.07)	0.17 (0.07)	0.23 (0.07)
Incorrect	0.14 (0.05)	0.09 (0.06)	0.06 (0.06)	0.11 (0.05)	0.08 (0.05)	0.11 (0.05)
Confabulated	0.04 (0.03)	0.01 (0.03)	0.04 (0.03)	0.02 (0.03)	0.02 (0.03)	0.05 (0.03)
Q Phase						
Correct	1.20 (0.18)	0.89 (0.20)	0.85 (0.20)	1.26 (0.19)	0.90 (0.18)	0.78 (0.19)
Incorrect	0.68 (0.15)	0.81 (0.16)	0.73 (0.16)	0.85 (0.15)	0.70 (0.15)	0.67 (0.15)
Confabulated	0.15 (0.08)	0.18 (0.08)	0.09 (0.08)	0.14 (0.08)	0.14 (0.08)	0.15 (0.08)
Both Phases						
Correct	1.43 (0.19)	0.94 (0.21)	1.08 (0.22)	1.41 (0.20)	1.07 (0.19)	0.97 (0.20)
Incorrect	0.82 (0.16)	0.91 (0.17)	0.79 (0.17)	0.97 (0.16)	0.78 (0.16)	0.77 (0.16)
Confabulated	0.19 (0.08)	0.19 (0.09)	0.13 (0.09)	0.16 (0.16)	0.16 (0.08)	0.19 (0.08)

Note. FR = free recall, Q = questioning

4.2.7 - Accuracy of Recall

Recall accuracy was determined by dividing the number of *correct* details reported by the *total* number of details reported. Adjusted mean accuracy scores for both interview phases and for the entire interview are presented in Table 4.5. Three separate 3 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were conducted to determine whether recall accuracy was influenced by age or interview. Significant interactions were investigated with Tukey's HSD tests.

Table 4.5

Adjusted mean accuracy of recall scores, as a function of age and interview (standard errors in brackets)

	Free Recall Phase	Questioning Phase	Both Phases
Age			
Young	0.96 (0.01)	0.87 (0.01)	0.92 (0.01)
Young-old	0.94 (0.01)	0.81 (0.01)	0.88 (0.01)
Old-old	0.93 (0.01)	0.81 (0.01)	0.87 (0.01)
Interview			
SI	0.94 (0.01)	0.80 (0.01)	0.86 (0.01)
MCI	0.95 (0.01)	0.83 (0.01)	0.89 (0.01)
ECI	0.95 (0.01)	0.85 (0.01)	0.91 (0.01)

When accuracy of recall across the entire interview was considered, main effects were found for both age, F (2, 143) = 15.68, MSE = .002, $\eta_p{}^2$ = .18, p < .001, and interview type, F (2, 143) = 10.16, MSE = .002, $\eta_p{}^2$ = .12, p < .001. Young adults were more accurate (M = .92) than young-old (M = .88) and old-old (M = .87) adults. More accurate information was elicited with the ECI (M = .91) than the MCI (M = .89), which elicited more accurate information than the SI (M = .86). The interaction effect was not significant, F (4, 143) = 1.07, MSE = .002, p = .37.

In the free recall phase, a main effect of age was found, F (2, 143) = 6.33, MSE = .002, $\eta_p{}^2$ = .08, p < .001. Young adults were more accurate (M = .96) than young-old (M = .94) and old-old (M = .93) adults. However, no main effect of interview type, F (2, 143) = 1.18, MSE = .002, p = .31, and no interaction effects, F (4, 143) = .50, MSE = .002, p = .74, were found.

In the questioning phase, main effects for both age, $F(2, 143) = 12.04$, $MSE = .01$, $\eta_p^2 = .14$, $p < .001$, and interview type, $F(2, 143) = 4.19$, $MSE = .01$, $\eta_p^2 = .06$, $p < .05$, were observed. Young adults were more accurate ($M = .87$) than either group of older adults ($M_{young\text{-}old} = .81$, $M_{old\text{-}old} = .81$). ECI accuracy ($M = .85$) was greater than MCI accuracy ($M = .83$). Similarly, MCI accuracy was higher than SI accuracy ($M = .80$). No interaction effect was observed, $F(4, 143) = 1.58$, $MSE = .01$, $p = .18$.

4.2.8 – Completeness of Recall

A measure of each participant's *completeness* of recall was computed by dividing the total number of correct details she or he reported by the total number of possible correct details (i.e., 699 details) (cf. Holliday, 2003a, b; Holliday & Albon, 2004). Mean completeness of recall scores were determined for both interview phases and for the entire interview and are presented in Table 4.6. To examine whether completeness of recall in the entire interview, free recall phase and questioning phase was influenced by interview type or age, three separate 3 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were conducted. Tukey's HSD tests were used to examine significant interactions.

Table 4.6

Adjusted mean completeness scores, as a function of age and interview (standard errors in brackets)

	Free Recall Phase	Questioning Phase	Both Phases
Age			
Young	0.15 (0.01)	0.12 (0.00)	0.26 (0.01)
Young-old	0.13 (0.01)	0.09 (0.01)	0.22 (0.01)
Old-old	0.10 (0.01)	0.08 (0.01)	0.18 (0.01)
Interview			
SI	0.10 (0.01)	0.10 (0.00)	0.19 (0.01)
MCI	0.13 (0.01)	0.09 (0.00)	0.23 (0.01)
ECI	0.15 (0.01)	0.10 (0.00)	0.25 (0.01)

Across the entire interview, main effects of age, F (2, 143) = 30.68, MSE = .002, $\eta_p^2 = .30$, $p < .001$, and interview, F (2, 143) = 14.69, MSE = .002, $\eta_p^2 = .17$, $p < .001$, were observed. Young adults (M = .26) were more complete than young-old adults (M = .22). Similarly, young-old adults were more complete than old-old adults (M = .18). ECIs were more complete (M = .25) than MCIs (M = .23), which were more complete than SIs (M = .19). A significant interaction effect was not found, F (4, 143) = .59, MSE = .002, p = .67.

Main effects of both age, F (2, 143) = 17.68, MSE = .001, $\eta_p^2 = .20$, $p < .001$, and interview, F (2, 143) = 23.80, MSE = .001, $\eta_p^2 = .25$, $p < .001$, were found for recall completeness in the free recall phase. The recall of young adults was more complete (M = .15) than that of young-old adults (M = .13), which was more complete than that of old-old adults (M = .10). ECIs elicited more complete recall (M = .15) than MCIs (M = .13), which elicited more complete recall than SIs (M = .10). No interaction effect was observed, F (4, 143) = .53, MSE = .001, p = .72.

In the questioning phase, a main effect of age was observed, F (2, 143) = 15.99, MSE = .001, $\eta_p^2 = .18$, $p < .001$. Young adults were more complete (M = .12) than young-old (M = .09) and old-old (M = .08) adults. No main effect of interview type, F (2, 143) = .40, MSE = .001, p = .67, and no interaction effects, F (4, 143) = .32, MSE = .001, p = .86, were observed.

4.3 - Discussion

The aim of this study was to examine the quantity and quality of reports about a witnessed event as a function of interview type and age. In the following discussion, observations relating to each of these variables will be considered in turn.

4.3.1 – Comparing the Recall of Young, Young-old and Old-old Adults

As predicted, and consistent with previous research about the eyewitness recall ability of older witnesses (e.g., List, 1984; Yarmey & Kent, 1980), recall performance declined with age. Specifically, when the number of correct details reported in the free recall phase of interviews was examined, it was found that young adults and young-old adults remembered more correct Action and Person information than old-old adults. However, the number of correct Object and Surrounding details recalled declined across each age group, such that young adults recalled more correct details than young-old adults, who recalled more than old-old adults. Overall, the free recall performance of young adults was better than that of young-old adults, which was better than that of old-old adults. This finding is interesting, as it suggests that in general, the ability to freely recount a to-be-remembered event begins to decline in young-old age and continues to deteriorate in late life. It is also consistent with a meta-analysis by Verhaeghen, Marcoen, and Goossens (1993), which revealed that young adults' free recall of written stories was better than that of young-old adults, which was better than that of old-old adults. Interestingly, the present study also found that the rate of decline between young and young-old age (11%) was less marked than the rate of decline between young-old and old-old age (23%). This supports the argument that recall does not decline uniformly as age increases (see also Baeckman et al., 2000).

In the questioning phase of interviews, young adults recalled more correct Person and Surrounding details than young-old and old-old adults. Young-old adults also recalled more correct Person information than old-old adults. When recall was collapsed across detail types, young adults recalled more correct information than young-old and old-old adults. The observation that old-old adults recalled fewer correct details than young-old adults in the questioning phase, but not in the free recall phase, may indicate that old-old adults are more cautious than young-old adults when answering questions. However, given that there were no significant differences in the number of uncertain responses produced by each age group, it seems unlikely that old-old adults were using a higher confidence threshold for reporting information. Instead, old-old adults may have simply forgotten more details than young-old adults and consequently had less information to add by the time the questioning phase was reached. The observation that young-old and old-old adults' free recall and questioning phase performance differed further supports the argument that recall processes do not experience the same pattern of decline with advancing age (e.g., Baeckman et al., 2000).

Across the entire interview, young adults and young-old adults recalled more correct Action, Object, and Surrounding information than old-old adults. Conversely, young adults recalled more correct Person details than young-old adults, who recalled more correct Person details than old-old adults. As predicted, when recall was collapsed across detail types, young adults reported more correct information than young-old adults, and young-old adults recalled more correct information than old-old adults. These results suggest that memory for Action, Object, and Surrounding details remains stable until very late in life (i.e., > 75-years), whereas memory for Person information begins to deteriorate slightly earlier. Such findings are interesting because scant information exists about how memory for different types of details changes with advancing age. In addition, the observation that overall correct recall declined with advancing age is congruent with previous eyewitness research (e.g., Brimacombe et al., 1997; Coxon & Valentine, 1997; Yarmey & Kent, 1980). For the first time, however, the present study has highlighted some of the specific characteristics of this decline.

No age differences in the overall number of confabulated or incorrect details recalled were found. These findings demonstrate that recall difficulties in older adults are due to recalling too few correct details, rather than to reporting too many erroneous details. The observation that confabulation does not increase with advancing age is consistent with the work of McMahon (2000), Gudjonnson (1992), and Gudjonnson and Sigurdsson (1996). Similarly, the observation that incorrect details were recalled equally often by older and younger adults is consistent with the findings of other CI studies involving older adults (McMahon, 2000; Mello & Fisher, 1996). Interestingly, when older adults' recall is assessed using a question-answer test format (Coxon & Valentine, 1997; Yarmey & Kent, 1980), this group tends to produce more incorrect responses than young adults. Such an emphasis on testing may cause negative stereotypes about older adults' memories to become more salient, which in turn, may adversely influence older adults' memory performance (Hess et al., 2003). This argument may also help to explain the observation that young adults remembered more correct details than young-old adults in the questioning phase (see above).

A comparison of the accuracy rates of each age group revealed that young adults were more accurate than young-old and old-old adults across every interview phase. This finding is congruent with previous eyewitness (e.g., Brimacombe et al., 1997; List, 1986; Searcy et al., 2001; Yarmey, 2000) and general memory (e.g., Smith, 1977) literature, although it contradicts the results of other studies that have tested the CI with older adults (McMahon, 2000; Mello & Fisher, 1996). Neither McMahon (2000) nor Mello and Fisher (1996) found significant age-differences in recall accuracy. As mentioned previously, however, each of these studies was beset with methodological problems that may have influenced observed accuracy rates. For example, although McMahon's (2000) results were in the same direction as those observed in the present study (i.e., mean accuracy for older adults = .78; mean accuracy for younger adults = .87), her use of small samples with large age ranges may have made this difference statistically insignificant.

Interestingly, the present study found no difference between the accuracy rates of young-old and old-old adults. This indicates that although old-old adults recall fewer details than young-old adults, the quality of their testimony is not compromised. Such observations are contrary to the results of Brimacombe et al. (2003), which revealed that young-old adults (59-74-years) were more accurate than old-old adults (75-88-years) when asked to recall a to-be-remembered video. Brimacombe et al. (2003), however, assessed recall by asking questions in a courtroom-style format (i.e., participants were asked open and closed ended questions by one experimenter, and were then cross-examined by a second experimenter), whereas the present study assessed recall using a method that was interviewee-directed (i.e., the SI, MCI, and ECI). As argued above, age differences may be more pronounced when questions are asked in an examination-style format.

When completeness scores were compared across the entire interview, the reports of young adults were found to be more thorough than those of young-old adults, which in turn, were more thorough than those of old-old adults. This finding is consistent with previous eyewitness research (Yarmey, 1996, 2000). When completeness scores within each interview phase were considered, however, two unique, phase-specific patterns emerged. The accounts of young-old adults were just as complete as those of young adults in the questioning phase, but less complete than young adults in the free recall phase. In both phases, old-old adults gave the least complete recall.

4.3.2 – Interviewing Young, Young-Old and Old-Old Adults with the ECI and MCI

As predicted, participants from each age group recalled more correct details when interviewed with the ECI and MCI than when interviewed with the SI. Specifically, the ECI increased correct recall by 20% for young adults, 27% for young-old adults and 18% for old-old adults, while the MCI increased correct recall by 14% for young adults, 17% for young-old adults and 15% for old-old adults[15].

[15] These figures are based on adjusted means obtained from the Age x Interview interaction analysis performed on the total number of correct details elicited across interview phases.

Such improvements are similar to those observed in other studies that have used the SI as a comparison interview (e.g., with adult participants, Gwyer & Clifford, 1997; with children, Holliday, 2003a, b; meta-analysis, Köhnken et al., 1999; Köhnken, Schimossek, Aschermann, & Hofer, 1995). The observation that each CI improves recall by approximately the same amount, regardless of participants' age, suggests that older adults do not have difficulty understanding the CI mnemonics and are able to use them effectively. Although it may be impossible to eliminate underlying age differences in recall (i.e., older adults recall less information than young adults, regardless of interview type), it is encouraging to find that the ECI and MCI can significantly enhance the recall of older adults.

For each age group, the facilitative effects of the MCI and ECI stemmed primarily from the free recall, rather than the questioning phase, of interviews. Specifically, the free recall phase of the ECI and MCI resulted in more correct Action, Person, Object, and Surrounding information than the SI. In the questioning phase, however, no interview effects were found. The observation that ECI and MCI questioning phases contribute minimally to their improvement in correct recall is consistent with the research of Holliday (2003a, b; Holliday & Albon, 2004). Conversely, other researchers have found that the questioning phase of the CI results in more correct details than the free recall phase (Memon et al., 1997b; Milne & Bull, 2003), or that there are no differences in recall between the two phases (Granhag & Spjut, 2001). Such inconsistencies might be explained, in part, by the fact that different researchers introduce the CI mnemonics at different stages during the course of their CIs. As in the present study, Holliday and colleagues (Holliday, 2003a, b; Holliday & Albon, 2004) included the CI mnemonics in the free recall phase and administered these techniques immediately after participants had completed their initial narrative of the to-be-remembered event. Milne and Bull (2003) and Memon et al. (1997b), however, administered the *change order* mnemonic[16] of the CI in a "second retrieval" phase that was preceded by an initial free recall attempt and a questioning phase. In order to make meaningful cross-study comparisons about participants' performance in each interview phase it is necessary to first ensure that the structure of these phases is similar.

[16] Milne and Bull (2003) and Memon et al. (1997b) omitted the *change perspective* technique from their CIs.

The observation that the CIs elicited more correct Action, Person, Object, and Surrounding details than the SI for each age group is consistent with several studies involving both adults and children. For example, Milne et al. (1995) found that the CI elicited more correct information about people and actions than the SI, whereas Memon et al. (1997b) and Granhag and Spjut (2001) found that the CI elicited more correct Object and Action details. Others have noted that the CI elicits more correct Person, Action, Object (Holliday, 2003a, b), and Surrounding / Location details (Holliday, 2003b; Holliday & Albon, 2004; Memon et al., 1992). Cross-study variability in the types of correct details recalled may partly stem from differences in the stimulus theme. For example, if a to-be-remembered event involved many actors, there would be more Person details for participants to mention. Similarly, the salience of different detail types may depend on the nature of the event (Akehurst et al., 2003).

For each age group, the free recall phase of MCIs and ECIs resulted in slightly more incorrect Action and Surrounding details than the free recall phase of the SI. Conversely, in the questioning phase, more incorrect Action details were reported with the SI than with the MCI or ECI. The questioning phase of the SI and MCI also resulted in more incorrect Person details than that of the ECI. When the two interview phases were combined, however, no overall differences in the number of incorrect Action, Object, or Surrounding details resulted for any age group, although more incorrect Person details were recalled with the SI and MCI than with the ECI. When collapsed across detail type, the ECI and MCI did not elicit more incorrect information than the SI. This finding is consistent with studies that involved children (e.g., Akehurst et al., 2003; Holliday, 2003a, b) and adults (e.g., Memon et al., 1997b) as participants.

For each age group, it was found that the questioning phase of SIs resulted in more confabulated Action details than the questioning phase of MCIs or ECIs. The total number of confabulated details recalled in the questioning phase of SIs was also greater than that recalled in MCI questioning phase, although this effect was only marginally significant. No interview differences in the number of confabulated details were found in the free recall phase. Combining both interview phases led to a greater number of confabulated Action details and a greater overall number of confabulated details in SIs than in MCIs or ECIs. Previous research has found that there is either no significant difference in the amount of confabulated information recalled in each interview type (e.g., Akehurst et al., 2003; Memon et al., 1997b), or that the CI elicits slightly more confabulated details than the SI (e.g., Brown & Geiselman, 1990; Köhnken et al., 1992). It should be noted, however, that in the present study, the number of confabulated details elicited by each interview type was actually very small, ranging from 1.85 to 3.78 details, on average. This implies that confabulations have a negligible impact on overall testimony.

In addition, it was found that for each age group, the ECI and MCI elicited information that was slightly more accurate than that elicited by the SI. Although Akehurst et al. (2003) also observed that the CI improves recall accuracy, many CI studies involving both adults and children have not found a significant difference between CI and SI accuracy rates (Holliday, 2003a, b; Holliday & Albon, 2004; Köhnken et al., 1999; Memon et al., 1997b). Interestingly, however, the overall difference in ECI, MCI and SI accuracy rates observed in the present study (i.e., 3-4%) and that found by Akehurst et al. (i.e., 3%) are the same magnitude and in the same direction as the (non-significant) difference of 3% observed in Köhnken et al.'s (1999) meta-analysis.

The sizes of the accuracy rates observed in the present study are also comparable to those found in other studies, which generally report a range from 80% to 86% for the SI, and 81% to 90% for the CI (Fisher et al., 2002; Holliday, 2003a, b; Holliday & Albon, 2004; Köhnken et al., 1999; McMahon, 2000; Memon et al., 1997b; Milne & Bull, 2003). The observation that the present accuracy rates are at the high end of this spectrum may reflect the fact that responses involving uncertainty (e.g., "I'm not sure, he *might* have been blonde") were not included in accuracy analyses.

A comparison of free recall and questioning phase accuracy scores (Table 4.5) shows that for each age group, the free recall phase of interviews resulted in more accurate information than the questioning phase. This is consistent with the work of Milne & Bull (2003), which demonstrated that the free recall phase elicits the most reliable information. According to Milne and Bull (2003), questioning may lower accuracy because it leads to an increase in cue specificity, which in turn has been shown to increase the number of correct and incorrect details reported (Lamb et al., 1996). It is also interesting to note that the CI enhanced recall accuracy in the phase that is most in need of improvement (i.e., the questioning phase).

When completeness scores (defined as the total number of correct details reported divided by the total number of possible correct details) were examined, the ECI and MCI elicited more complete recall than the SI. This effect was completely due to the free recall phase of interviews, as there was no effect of interview type on the completeness of recall in the questioning phase. The observation that the CI is able to improve recall completeness is consistent with the work of Holliday (2003a, b) and Holliday and Albon (2004).

4.3.3 – Comparing the ECI and MCI

For each age group, the ECI elicited slightly more correct information than the MCI (6% for young adults, 10% for young-old adults, and 3% for old-old adults), with no substantial decline in recall accuracy. This suggests that the *change perspective* mnemonic (the only aspect of the two interviews to differ) was beneficial for each group. Considering that the *change perspective* mnemonic is among the most heavily criticized aspects of the CI (Boon & Noon, 1994; Milne & Bull, 1999), with both police officers (Clifford & George, 1996) and researchers (e.g., Memon et al., 1997b) omitting it from their CIs, this finding is particularly important.

Several studies conducted with adult participants have examined the effects of each CI mnemonic on recall (Boon & Noon, 1994; Memon et al., 1996; Milne & Bull, 2002). However, these have reached mixed conclusions about the efficacy of the *change perspective* technique. For example, Boon and Noon (1994) found that the *change perspective* mnemonic, unlike the other cognitive mnemonics, did not enhance recall when combined with the *report everything* mnemonic. In contrast, Memon et al. (1996) and Milne and Bull (2002), found that recall elicited with the *change perspective* mnemonic (given on its own) was as good as that elicited by the other mnemonics. The results of these last two studies suggest that each mnemonic contributes incrementally to the CI's overall effect, or that a combination of some CI mnemonics may enhance recall (Milne & Bull, 2002). Each of these possibilities is consistent with, and might help to explain, the observation that the *change perspective* mnemonic was beneficial in the present study. It is also possible, however, that the simple act of recounting the film for a second time, regardless of the perspective taken, may have been responsible for the observed improvement in recall. Indeed, it has been shown that memory can be enhanced with the use of multiple retrieval attempts (Turtle & Yuille, 1994).

Controversy exists about whether the *change perspective* mnemonic should be used with older adults, who are generally less efficient than young adults at performing cognitive tasks that involve perspective change (Herman & Coyne, 1980; Mello & Fisher, 1996). The results of the present study, however, imply that the *change perspective* mnemonic increases correct recall among young and older adults by approximately the same amount. Consequently, although young-old and old-old adults might be worse at changing perspectives than young adults, the *change perspective* instruction still appears to have positive effects *within* these age groups.

4.3.4 - The Forensic Importance of Recalled Information

The coding scheme used in the present study assigned equal weight to every detail reported. This system reflects the fact that all details have the potential to benefit a police investigation. However, it is also true that certain types of information may have greater forensic relevance than others (e.g., remembering a suspect's appearance may be more useful than remembering that a tree was observed in the distance). It may therefore have been more appropriate to examine interviews using a coding scheme that accounted for the forensic importance of information[17]. To determine whether this was the case, a coding system that incorporated police perceptions of investigative relevance was developed and used to re-analyse the present results. The results obtained with this forensically oriented coding scheme were compared to the results observed with the original coding scheme (see Appendix L). Substantial differences between the results obtained with these scoring systems may imply that the original coding template is not as ecologically valid as it could be.

The only other (published) study to involve police officers in the construction of a coding scheme was conducted by Roberts and Higham (2002). In this study, four police officers and a crown counsel were asked to review the to-be-remembered video stimulus and to identify information that would be considered relevant in a

[17] It could be argued that the classification of details into Action, Person, Object, and Surrounding information reflects the forensic relevance of each detail (Holliday, 2004, personal communication). For example, Surrounding information may be less important than Person or Action information. However, in some cases Surrounding details (e.g., tree seen in distance) may be more salient for an investigation than Person details (e.g., hair colour of suspect). Furthermore, within each Action, Person, Object or Surrounding category some details may be more useful for an investigation than others. For example, in the case of Person information, remembering the body build and hair colour of a suspect may be more important than remembering the colour of shoes worn by the lady who comforted the car owner.

criminal investigation. The reviewers were asked to assume that only one witness observed all the events in the video, that the witness did not know any of the characters in the video, and that the witness did not have prior knowledge about the crime setting. Relevant information was defined as details that would allow a police officer or prosecuting attorney to gain knowledge about the events that occurred (e.g., "he walked to the fence and paused"), the people involved (e.g., "the man had brown hair"), and the weapon used (e.g., "the knife handle was black"). Information reported by participants was scored as being *correct relevant* (present in the video and considered relevant by at least one reviewer), *correct peripheral* (present in the video but not considered relevant by any of the reviewers), *erroneous* (inconsistent with the details in the video), or *confabulated* (not present in the video).

As in the present study, Roberts and Higham's (2002) CI administered the *report everything* and *context reinstatement* mnemonics prior to participants' free narrative. This narrative was followed by the *change order* mnemonic and then the *change perspective* mnemonic. Lastly, participants were questioned about information they had already reported. Roberts and Higham found that the CI elicited 50% of the information considered relevant by reviewers. Most of this information was recalled in the free recall phase of interviews, following instructions to *report everything* and mentally *reinstate the context.* Interestingly, it was also found that peripheral details were less likely to be monitored for accuracy than relevant ones. Importantly, however, Roberts and Higham (2002) did not compare the results of their officer-derived coding system with the coding systems routinely employed in CI research (e.g., Akehurst et al., 2003; Holliday, 2003a, b; Memon et al., 1997a, b).

In the present analysis, nine police officers attending professional development courses at Kent Police College, Maidstone, volunteered to review the video stimulus. Officers (7 men, 2 women) were aged 24 to 54 (M = 37.44-years, SD = 8.06), had served in the police force for between 15-months and 23-years (M = 8.10-years, SD = 8.49) and reported having 1- to 23-years (M = 7.89-years, SD = 8.68) experience interviewing witnesses and victims. Five officers were police constables, two were detective constables and two were detective sergeants. All officers worked in constabularies across South East England.

Officers were asked to determine which aspects of the video were relevant to a criminal investigation. Officers were told that they could view the video as often as they liked, that their answers would be kept confidential, and that the exercise was not a test of policing ability. In addition, officers were asked to assume that only one witness observed the incident, that the witness did not know the characters in the video, and that the witness had no prior knowledge about the crime setting (cf. Roberts & Higham, 2002). Relevant details were defined as information that would be useful in assisting an investigation (e.g., information that should be included in a witness statement). Unlike in Roberts and Higham's (2002) study, officers were not told to identify information specific to events, people and weapons. This ensured that the researcher did not impose her ideas about detail relevance on officers. Officers also received the above instructions in written form (see Appendix Q).

Overall, officers did not provide detailed or thorough responses (e.g., officers wrote statements like "the actions people made (are important)"). To obtain more complete accounts all officers were re-contacted and interviewed individually. Interviews occurred approximately two weeks after the initial session in an empty classroom at the police college. The purpose of the study was reiterated and officers were again told that they could view the video as many times as they wanted[18]. Officers were asked to describe the aspects of the video they deemed investigatively important in as much detail as possible. After officers provided an uninterrupted account of this information the researcher asked open-ended questions about any issues that were vague or unclear (e.g., "you mentioned that X was important... what aspects of X do you consider important?"). All interviews were audio-taped and transcribed.

The researcher and a second independent rater examined responses from both Time 1 (written) and Time 2 (verbal). Details that officers considered important were used to construct an exhaustive list of forensically relevant information. Next, the number of officers who agreed about the importance of each detail was determined. Details that were considered important by less than 4 of the officers were removed from this list[19]. The researcher and rater compared lists, resolving disagreements through discussion. Next, Kent County Constabulary's *Operational Performance Aid* (2001), which provides guidelines to structure investigations, was consulted. Information described in the sections dealing with volume crime and theft of and

[18] In total, officers viewed the video an average of 2.88 times (range = 2 to 5 viewings).
[19] This ensured that the agreement between officers was always at least 33%. Although inter-rater agreements of 70% and above are generally considered to be high (Howell, 1997), a more lenient agreement criteria was used in the present study because all officers had received extensive training about evidence gathering.

from motor vehicles that were not already on the list were added (see Appendix R for the final list of the details that were considered investigatively relevant). On the basis of this list, the original coding template used in the present study (see Appendix L) was divided into two separate templates. Details from the original template that were consistent with items from Appendix R (i.e., relevant information) were grouped together in a Relevant template (see Appendix S). In total, this template was comprised of 457 details. The remaining details from the original coding template (242 details) were placed in a Peripheral template (cf. Roberts & Higham, 2002; see Appendix S). Both the researcher and the second rater divided the original coding template in this manner. Overall agreement between the two individuals was 93%.

For the purpose of scoring, *correct relevant* information was information that appeared in the relevant template (see Appendix S). *Correct peripheral* information was information that did not appear in the Relevant Information template but *did* appear in the video (see Appendix S). *Incorrect relevant* information was inconsistent with the details in the Relevant Information coding template (e.g., saying that a suspect had blonde, rather than brown, hair). *Incorrect peripheral* information was inconsistent with details that had peripheral importance (e.g., saying that the man who went to the garbage bin had a white, rather than a black, top). Confabulations (details reported by participants that were not actually in the video) were also divided into relevant and peripheral information. If a participant said that the lady with the bicycle (classified as a relevant character by officers) also had a dog, it was considered *confabulated relevant* information. However, if a confabulation involved a peripheral character (e.g., saying that the man who went to the bin had a dog) it was classified as a *confabulated peripheral* detail. If a confabulation was clearly consistent with information that was deemed relevant for an investigation (e.g., saying that there was a fourth suspect, when there were only 3 suspects) it was classified as a *confabulated relevant* detail. However, if a confabulation involved fabricating another witness (e.g., saying that an extra lady walked past) it was impossible to determine whether officers would have considered this person important. In such cases, the confabulation was always considered to be Peripheral.

A different independent rater scored a total of 18 interviews. Six of these (2 SI, 2 MCI, 2 ECI) were from the young adult group, 6 (2 SI, 2 MCI, 2 ECI) were from the young-old group, and 6 (2 SI, 2 MCI, 2 ECI) were from the old-old group.

Inter-rater reliability was calculated for the total number of Correct Relevant, Correct Peripheral, Incorrect Relevant, Incorrect Peripheral, Confabulated Relevant and Confabulated Peripheral details. The resulting correlations of the rater and researcher's scores were: $r_{correct\ relevant} = .97$, $r_{correct\ peripheral} = .94$, $r_{incorrect\ relevant} = .66$, $r_{incorrect\ peripheral} = .84$, $r_{confabulated\ relevant} = .87$, $r_{confabulated\ peripheral} = .77$ (all p's $< .01$).

The mean number of correct relevant, correct peripheral, incorrect relevant, incorrect peripheral, confabulated relevant and confabulated peripheral details recalled in the free recall phase, questioning phase and across both interview phases were determined for each age and interview condition. A series of ANCOVAs[20] that used age and interview type as dependent variables were performed on each category of detail. Tukey's HSD post hoc tests were conducted to identify significant differences between conditions. The results of these analyses are presented in Appendix T. The original and forensically relevant coding templates produced similar results (see Appendix T). This finding demonstrates that the original coding scheme, although designed with no police input, nevertheless reflects the forensic importance of participants' responses. In turn, this implies that the original coding scheme is ecologically valid. The original coding scheme used in the present study will therefore be employed in the remaining studies of this thesis.

4.4 – Chapter Summary and Rationale for Study 3

The present study examined the quantity and quality of recall for a video stimulus as a function of type of interview (ECI, MCI, SI) and age (17-31-years, 60-74-years, 75-95-years). Unlike other recent studies to examine the use of the CI with older adults (McMahon, 2000; Searcy et al., 2001) and contrary to the beliefs of many UK police officers (Study 1), the present research demonstrated that the ECI and MCI can improve the recall of older adults. Consistent with previous research (e.g., Brimacombe et al., 1997, List, 1986), however, old-old adults still recalled less correct information than young-old adults, who recalled less correct information than young adults.

The results of this study were observed after controlling for the effects of procedural differences that could reflect interviewer bias (e.g., length of interview, number of questions asked). Similarly, analyses of interview quality revealed no

[20] Interview duration was used as a covariate (as outlined in Appendix T).

significant differences across conditions. Taken together, this suggests that the facilitative effects of the ECI and MCI, as well as the detrimental effects of increasing age on recall, can be attributed mainly to interview- and age-related differences, rather than to biases resulting from interviewer expectations. It is always possible, however, that some participants were more at ease during the course of an interview than others (e.g., because of their own feeling of rapport with the interviewer) and that such differences could have influenced recall. If participants in one particular condition were more comfortable than those in other conditions, systematic differences in recall may have occurred.

It is also possible that social demographic variables may have influenced results. For example, the participants in each age group may have achieved different levels of formal education[21]. Although education has not been clearly linked to eyewitness recall or to performance on the CI (e.g., Geiselman et al., 1984; see also McMahon, 2000), age differences in general recall may be reduced if participants are matched for education (Adams-Price, 1992). An effort was made to re-contact older participants from the present study to determine their education level, although only 11 young-old and 29 old-old adults could be reached. Of these individuals, young-old adults had a higher level of education (M = 11.82-years, SD = 2.36) than old-old adults (M = 10.31-years, SD = 1.73), t (38) = 2.22, $p < .05$. Young adult participants were all undertaking an undergraduate degree at university. While such variability in education is common in research on ageing and memory (McMahon, 2000), it would have been preferable to match participants according to their education level, or to at least determine whether education acted as a covariate in analyses.

An additional variable that may have influenced the present results is depression. Since depression has been shown to adversely influence memory (Kinderman & Brown, 1997; Kizilbash, Vanderploeg, & Curtiss, 2002; Veiel, 1997), it is possible that if certain groups experienced more depression than others, a systematic bias in recall ability might have occurred. Indeed, several researchers have reported that depression is more common in late life (Alexopoulos, Borsen, Cuthbert et al., 2002; DeLeo & Diekstra, 1990; Evans, 1998; Rothermund & Brandtstaedter, 2003), although others have failed to support this claim (e.g., Brandtstaedter & Greve, 1994; Ryff, Singer, Love, & Essex, 1998).

[21] Indeed, the minimum age for leaving school in England rose from 12 years in 1899, to 14 years in 1918, to 15 years in 1947 and to 16 years in 1972 (Department for Education and Skills, 2002).

Finally, it could be argued that the distraction task used in the present study (i.e., a 30 minute discussion between interviewer and interviewee about topics unrelated to the study) was not appropriate. Although topics of conversation were the same for each participant (i.e., hobbies, world events), conversation structure was not standardized. It is therefore possible that some conversations were more effective at distracting participants from the to-be-remembered film than others. It is also possible that certain conversations were more effective at developing interviewee-interviewer rapport than others (e.g., young adults, but not older adults, may have found that they had more hobbies in common with the researcher).

The third study described in this thesis (Chapter 5) will replicate the results of Study 2 when the aforementioned methodological limitations are addressed. First, Study 3 will account for differences in participants' attitudes towards the interviewer and the interview process. Specifically, participants will be asked to indicate how relaxed they felt during the interview and how comfortable they were with the interviewer at the end of their testing session. Rating scores will be compared across conditions and if any differences are observed, they will be statistically controlled. Second, Study 3 will address the issue of education, by examining whether education level should be included as a covariate of eyewitness recall. Third, Study 3 will minimize the influence of depression on age- or interview- recall effects by using a self-reporting instrument of depression (the Beck Depression Inventory-II, Beck, Steer & Brown, 1996) to screen depressed participants from the sample. Finally, to eliminate distraction-task variability, Study 3 will employ a uniform distraction task that requires participants to perform a series of cognitive tests. These tests will also aid in the identification of cognitively impaired participants, who will be omitted from the sample.

Chapter V:

Interviewing young (18-31-years) and young-old (60-75-years) adults with the Cognitive Interview

Study 2 examined recall quantity and quality as a function of interview type (ECI, MCI, SI) and age (17-31-years, 60-74-years, 75-95-years). Findings indicated that the ECI and MCI elicited recall that was superior to that obtained with the SI, and supported previous memory and ageing research by demonstrating that overall recall performance declined with advancing age. However, Study 2 had several limitations. First, it failed to account for the fact that participants in each condition may have achieved different levels of formal education. It has been suggested that education level can influence performance on verbal intellectual functions (Ylikoski et al., 1998), visual and logical memory (Marcopoulos, McLain, & Giuliano, 1997), working memory (Deming, Chang, & Guiyun, 2003), free recall and cued recall (Lux, Reich, Hartje, & Skreczek, 2002; Vanderspoilden & Morais, 2001), as well as the spontaneous use of memory aids (Soler & Ruiz, 1996). It has also been shown that the effects of education on memory performance are more pronounced in later life (Arbuckle, Gold, Andres, Schwartzman, & Chaikelson, 1992). For example, Perlmutter and Nyquist (1990) found that education explained less than 1% of the variance in young adults' (20-50-years) memory performance, but 12% of the variance in older adults' (> 60-years) memory performance. Given that the older adults who were re-contacted in Study 2 had different education levels (12 years for young-old adults versus 10 years for old-old adults), it is possible that observed age effects were partially influenced by education. Although education has not been clearly linked to performance on the CI (e.g., Geiselman et al., 1984; McMahon, 2000) it is also possible that education level may have influenced observed interview effects. For example, participants with more education may have had less difficulty understanding or performing the CI mnemonics. The present study addressed the issue of education by determining whether it was a covariate of recall performance.

A second limitation of Study 2 was that it failed to account for the effects of depression on recall. Depressed individuals of all ages often perform worse on memory tasks than those who are not depressed (Burt, Zembar, & Niederehe, 1995; Elderkin-Thompson et al., 2003; Veiel, 1997). Specifically, depressed individuals are impaired on measures of verbal memory (Basso, Lowery, Neel, Purdie, & Bornstein, 2002), verbal fluency (Boone et al., 1994), executive functioning (Basso et al., 2002), learning ability (Horan, Pogge, Borgaro, Stokes, & Harvey, 1997), and non-verbal memory (Boone et al., 1994). Such deficits improve in response to therapeutic intervention (Fennig, Levine, Naisberg, & Elizur, 1987; Tarbuck & Paykel, 1995), and cannot simply be attributed to a lack of motivation (Richards & Ruff, 1989). Extensive research has also demonstrated that depression is more common among older adults (Alexopoulos et al., 2002; Evans, 1998; Rothermund & Brandtstaedter, 2003), although other research has failed to find significant associations between age and depression (Brandtstaedter & Greve, 1994; Ryff et al., 1998). Still other research has shown that the lifetime prevalence for depression follows a curvilinear pattern, with depressive symptoms increasing during young adulthood, decreasing during middle age, and increasing again in late life (Ernst & Angst, 1995; Gatz, Johansson, Pedersen, Berg, & Reynolds, 1993). It is possible, therefore, that older participants from Study 2 had a higher incidence of depression than younger participants, which might have obscured the effects of chronological age on recall.

To ensure that depression did not influence age or interview effects in this study, individuals with depressive symptoms were identified using the Beck Depression Inventory – Version II (BDI-II; Beck, Steer, & Brown, 1996; see Appendix U) and excluded from analyses. The BDI-II is a 21-item self-report instrument for measuring the presence and severity of depression in adults and adolescents, and is the most recent version of the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI has been shown to accurately identify depression among numerous groups, including: Adults from the general community (Lasa, Ayuso-Mateos, Vazquez-Barquero, Diez-Manrique, & Dowrick, 2000); adolescents (Leblanc, Almudevar, Brooks, & Kutcher, 2002; Marton, Chrurchland, Kutchner, & Korenblum, 1991); geriatric medical inpatients and outpatients (Norris, Gallagher, Wilson, & Winograd, 1987; Olin, Schneider, Eaton, Zemansky, & Pollock, 1992; Rapp, Parisi, Walsh, & Wallace, 1988); and geriatric psychiatric outpatients (Kogan, Kabacoff, Hersen, & Van Hasselt, 1994). The BDI's validity is comparable to that of the Hamilton Psychiatric Rating Scale for Depression and the Geriatric Depression Scale (Beck & Steer, 1993; Kogan et al., 1994; Norris et al., 1987). Nevertheless, the BDI has been criticised because items do not reflect specific theories of depression, are not consistent with the criteria for depression outlined by the American Psychiatric Association's *Diagnostic and*

Statistical Manual of Mental Disorders – 3rd edition (DSM-III; 1980) or DSM-IV (1994), and are often poorly worded (e.g., double negatives are used; Beck et al., 1996). The BDI-II was created to overcome these problems (Beck et al., 1996).

During initial testing, the BDI-II was administered to 500 psychiatric outpatients and 120 college students (Beck et al., 1996). Internal consistency for each population was .92 and .93, respectively. In addition, the scale had strong one-week test-retest reliability ($r = .93$) and correlated with an amended version of the BDI (the BDI-IA; $r = .84$), the Hamilton Psychiatric Rating Scale for Depression ($r = .71$), and the Beck Hopelessness Scale ($r = .68$). Later studies support these initial findings. For example, the BDI-II had high internal consistency ($\alpha = .92$) and reliability ($\alpha = .92$) when used with a sample of psychiatric outpatients (Steer, Ball, Ranieri, & Beck, 1997), and high internal consistency ($\alpha = .90 – .91$) when tested with college students (e.g., Dozois, Dobson, & Ahnberg, 1998; Osman et al., 1997). The BDI-II also has good construct validity with other depression scales (e.g., Primary Care Evaluation of Mental Disorders, Arnau, Meagher, Norris, & Bramson, 2001; BDI, Dozois, et al., 1998; Postpartum Depression Screening Scale, Beck & Gable, 2001; Structured Clinical Interview for *DSM-IV* Axis I Disorders, Sprinkle et al., 2002). In addition, the BDI-II has been shown to correlate strongly with the Geriatric Depression Scale (Jefferson, Powers, & Pope, 2001), and its use with geriatric inpatients has been supported (Steer, Rissmiller, & Beck, 2000). Steer et al. (2000) observed a coefficient alpha of .89 in their geriatric population and found that BDI-II scores were not significantly related to sex, age or ethnicity.

A third limitation of Study 2 was that it failed to assess participants' attitudes about the interview and interviewer. Some participants may have developed stronger rapport with the interviewer than others, which may have influenced the quality or amount of information recalled. Indeed, rapport between the interviewer and interviewee is generally recognised to be a critical factor in the quality of eyewitness testimony (Memon et al., 1997b; Memon & Stevenage, 1996a). The present study addressed this issue by asking participants to complete a short post-interview questionnaire that assessed their level of comfort with the interviewer. Rating scores were compared across conditions to determine whether any systematic differences occurred. Although anonymity was ensured, participants were aware that the researcher would read their responses at a later date. While participants may have therefore tailored their responses to suit perceived researcher expectations, a less biased measure of attitude toward the interviewer was difficult to construct.

In addition, Study 2 used a 30-minute non-standardized discussion between the interviewer and interviewee to prevent participants from mentally rehearsing the to-be-remembered-event. Since conversations were not uniform, some may have been more effective at distracting participants from the event than others. It is also possible that certain conversations fostered better interviewee-interviewer rapport (e.g., young adults may have had more hobbies in common with the interviewer). To eliminate such variability from the present distraction task, participants completed the MMSE (Folstein et al., 1975) and BDI-II (Beck et al., 1996) in the interval between stimulus presentation and interview[1].

Although the MMSE detects the presence of cognitive impairment, it is unable to determine the cause of this impairment. For example, the MMSE cannot distinguish between individuals with affective disorders (e.g., depression) and those with dementia (Folstein et al., 1975). To help understand the nature of impaired participants' cognitive decline, the Pyramids and Palm Trees test (PPT; Howard & Patterson, 1992; shown in Appendix V) was administered in addition to the MMSE and BDI-II. The PPT reliably identifies semantic (Hodges & Patterson, 1995; Simons, Graham, & Hodges, 2002) and Alzheimer's (Hodges & Patterson, 1995) dementia. Hodges and Patterson (1995), for example, demonstrated that PPT scores distinguished between controls and those with mild Alzheimer's dementia, as well as between those with mild and moderate Alzheimer's dementia. The PPT assesses the ability to access semantic representations (Howard & Patterson, 1992). For each of 52 test trials, individuals are presented with a target picture that has two pictures below it, and are asked to indicate (by pointing) which of the two pictures (e.g., palm tree or pyramid) is the most closely associated with the target (e.g., pyramid). Unlike other semantic memory tests (e.g., picture naming tasks), the PPT does not use words as input and requires no verbal response on the part of the participant (Hodges & Patterson, 1995). This ensures that poor performance on the PPT is due to semantic memory impairment, rather than to reading or object-naming problems (Simons et al., 2002).

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[1] Another reason for using the MMSE, BDI-II and PPT to distract participants, rather than a conventional task such as counting backwards (e.g., Brown & Lloyd-Jones, 2003), was to decrease the length of the testing session. Administering the MMSE, BDI-II and PPT at the end of the session would have increased demands on participants.

Consistent with Study 2, it was predicted that young-old adults (60-75-years) in the present study would recall fewer correct Action, Person, Object, and Surrounding details than young adults (18-31-years). In addition, it was hypothesized that the information recalled by young-old adults would be less accurate than that recalled by young adults (cf. List, 1986; Yarmey, 1993). Furthermore, it was predicted that the ECI and MCI would elicit more correct Action, Person, Object, and Surrounding details than the SI. Finally, it was believed that the ECI and MCI would result in more complete and accurate recall than the SI, as observed in Study 2.

5.1 – Method

5.1.1 - Participants

One-hundred and four individuals agreed to participate. Fifty-four (6 males, 48 females) were young adults between the ages of 18- and 31-years (M = 19.94-years, SD = 3.18), and fifty (14 males, 36 females) were between the ages of 60- and 75-years (M = 67.52-years, SD = 4.47). As in Study 2, young volunteers were undergraduate students from the University of Kent and received course credit for participating in the study. Young-old participants were recruited from local community organizations, social clubs for senior citizens, newspaper advertisements (see Appendix F), radio announcements, and leaflets (see Appendix F) posted around the city of Canterbury and the university. Participants were excluded from the study if their hearing was too poor to enable conversation, if they reported that they were visually impaired, or if they reported that they were unable to read. Old-old adults were not included in analyses because too few individuals from this age group volunteered (N = 4).

No participants scored below average on either the MMSE (< 27) or the PPT (< 47). The MMSE scores of young adults ranged from 28 to 30 (M = 29.63, SD = .56) and those of young-old adults ranged from 27 to 30 (M = 29.26, SD = .78). The PPT scores of young adults ranged from 48 to 52 (M = 50.21, SD = 1.21), as did those of young-old adults (M = 50.77, SD = 1.07). Four participants (3 young, 1 older) had BDI-II scores that were indicative of moderate to severe depression (i.e., scores were over 19). As depression can influence memory recall (Kizilbash et al., 2002) these individuals were excluded from all analyses. The final sample consisted of 51 participants (6 males, 45 females) aged 18-31-years (M = 19.82-years, SD = 2.99), and 49 participants (14 males, 35 females) aged 60-75-years (M = 67.59-years, SD =

4.49). The mean education level, and the mean MMSE, PPT and BDI-II scores for each age group are listed in Table 5.1.

Table 5.1

The Range, Mean and Standard Deviation for Education level, MMSE, PPT and BDI-II scores by age group

	Education (years)	MMSE	PPT	BDI-II
Young				
Range	11-16	28-30	48-52	0-18
M (SD)	13.06 (1.01)	29.61 (0.57)	50.23 (1.23)	7.51 (5.35)
Young-old				
Range	9-22	27-30	48-52	0-17
M (SD)	13.78 (3.08)	29.24 (0.78)	50.75 (1.07)	6.16 (3.96)

5.1.2 – Materials

The same 2min 40sec film used in Study 2 was shown to each participant. The video depicted three individuals attempting to break into a car in a busy car park. The purported thieves are noticed by several of 13 passers-by but are not stopped until the owners of the car return and frighten them away (see Appendix G for a full description of the video).

As in Study 2, each participant was given a SI, MCI or ECI. SIs followed the guidelines identified by Köhnken (1993) and the *Achieving Best Evidence* report (Home Office, 2001), whereas ECIs followed the protocols outlined by Fisher and Geiselman (1992). MCIs were identical to ECIs except that the *change perspective* mnemonic was omitted (see Appendix H for descriptions of these interviews).

Beck Depression Inventory-II (BDI-II).

This self-report instrument for measuring depression consists of 21 items that each correspond with a particular symptom of depression. For example, items measure self-dislike, loss of pleasure with life, and degree of pessimism. Each item is composed of four statements that are rank-ordered by severity of symptom from '0' (indicating a neutral statement, e.g., "I do not feel like a failure") to '3' (indicating high levels of a depressive symptom, e.g., "I feel I am a total failure as a person"). Scores on each item are summed to give a maximum possible score of 63. Scores of 14-19 are associated with mild depression whereas scores of 20-28 and 29-63 are associated with moderate and severe forms of depression, respectively (Beck et al., 1996). The inventory takes 5 to 10 minutes to complete (Beck et al., 1996). Refer to Appendix U for the BDI-II.

Pyramids and Palm Trees Test (PPT).

The three-picture version of the PPT (Howard & Patterson, 1992) was used to examine participants' ability to access semantic representations from pictures. For each of 52 test trials, individuals were presented with a target picture that has two pictures below it (see Appendix V for an example of a PPT trial) and are asked to point to one of two pictures (e.g., *palm tree* or *fir tree*) whose semantic meaning is the most closely related to the target (e.g., *pyramid*). Scores below 47 are indicative of clinical memory impairment (Howard & Patterson, 1992). If an individual is unable to decide which picture is the most appropriate, a score of 0.5 is assigned for that trial. The PPT takes 5-10 minutes to complete.

Mini-Mental State Exam (MMSE).

As in Study 2, the MMSE (see Appendix E; Folstein et al., 1975) was used to evaluate cognitive status. This 5-10 minute test consists of 20 questions that assess orientation, attention, language abilities, immediate recall, short-term recall, and the ability to follow simple verbal and written commands (Crum et al., 1993). A maximum score of 30 can be achieved, and scores of 0-26 are associated with cognitive impairment (Feinberg & Whitlatch, 2001; Kalman et al., 1995).

5.1.3 - Design

A 3 (interview: SI, MCI, ECI) x 2 (age: young, young-old) factorial design was used in this study. The young SI, young-old MCI and young-old ECI conditions each had 16 participants, the young-old SI and young MCI conditions each had 17 participants, and the young ECI condition had 18 participants.

5.1.4 - Procedure

5.1.4.1 - Interviewer Training

The researcher conducted all interviews, as in Study 2. After Study 2, however, the researcher was considered to be sufficiently competent at each type of interview and no further training was sought. Nevertheless, as there was a one month delay between the present study and Study 2, the researcher's interviewing skills were refreshed by reviewing the *Achieving Best Evidence* document (Home Office, 2001), Köhnken's (1993) Structured Interview manual, and Fisher and Geiselman's (1992) CI manual. The researcher also listened to several interview tapes from Study 2 and conducted a practice SI and ECI on a colleague.

5.1.4.2 - Participant Testing

As in Study 2, participants were tested individually. Prior to showing the video, each volunteer read an information sheet and read and signed a consent form (see Appendix I). Participants were then given the same pre-video viewing instructions as in Study 2 (see Section 4.1.4.2) and were asked to watch the video while the researcher left the room.

After viewing the video, each participant spent 15 to 20 minutes completing the BDI-II, PPT and MMSE. The order in which these measures were administered was counterbalanced, such that each participant completed the tests in one of three different sequences: MMSE, BDI-II, PPT; BDI-II, PPT, MMSE; or PPT, MMSE, BDI-II. Participants spent the next 10 minutes in conversation with the researcher before being given a SI, MCI or an ECI. As in Study 2, conversations revolved around the hobbies and interests of the participant and current world events.

Only one room was available for research purposes, therefore interviews were conducted in the same location that the video had been shown. To reduce memory-enhancing effects of physical context reinstatement that might interfere with the ECI and MCI's mental context reinstatement techniques (Tulving & Thomson, 1973; Smith, 1988), the researcher altered the environment by repositioning participants to face the opposite wall and by opening the window blinds. Time limits were not placed on interviews. Instead, interviews were concluded when participants responded negatively to the question "is there anything else you can remember about the video?" Participants were asked to evaluate the interview by indicating their level of agreement (measured on a scale of 1, totally disagree, to 5, totally agree) with the statements: "I felt comfortable and relaxed during the interview" and "I developed good rapport with the interviewer". Participants were debriefed and thanked.

5.1.4.3 - Interview Coding

Interviews were audio-taped and transcribed as in Study 2. Transcripts were edited of information that might identify participants and were scored by the researcher. A second independent rater scored 12 interviews – six (2 SI, 2 MCI, 2 ECI) from the young adult group and six (2 SI, 2 MCI, 2 ECI) from the older group. Responses were coded and scored according to the method outlined in Study 2, which is based on the work of Memon et al. (1996, 1997a, b) and Holliday (2003a, b; Holliday & Albon, 2004). The film was independently converted to template form by the researcher and an assistant who was unaware of the nature of the study. As in Study 2, each piece of information in the video was classified as an Action, Person, Object, or Surrounding detail (see Appendix K). A summary template, reflecting the agreement between the two individuals was constructed for use in coding. When a participant mentioned a detail that was not in the summary template, the researcher would confirm the detail by watching the video. The final version of this template (shown in Appendix L) contained 699 pieces of information: 121 action details; 387 person details; 81 object details; and 110 details about the surroundings.

As in Study 2, interview transcripts were re-written in template form such that irrelevant, subjective and vague responses were omitted. If a participant repeated information during an interview it was only coded the first time it was mentioned. Furthermore, if a participant changed a response during an interview only the final response was scored (cf. McMahon, 2000). Responses that expressed uncertainty (e.g., "His hat *might* have been blue, but I'm not sure") were scored independently of other responses (cf. Memon et al., 1994, 1995). As in the summary template, each unit of relevant information mentioned by participants was classified as a Person, Action, Object, or Surrounding detail (see Appendix M for an example of an interview in template form). The details in each interview template were then scored for accuracy. Correct details matched the video, incorrect details were discrepant from the video, and confabulated details were not present in the film (see Section 4.1.4.3 for examples). It was also noted whether details were reported in the free recall or questioning phase of interviews (cf. Memon et al., 1997a, b; Holliday, 2003a, b; Holliday & Albon, 2004).

Inter-rater reliability was determined for the total number of correct, $r_{correct} = .91, p < .001$; incorrect, $r_{incorrect} = .89, p < .001$; and confabulated details, $r_{confabulated} = .83, p < .001$, reported during interviews. Inter-rater reliability for the total number of correct, incorrect and confabulated *uncertain responses* was found to be $r_{correct} = .73$, $p < .05$; $r_{incorrect} = .96, p < .001$; and $r_{confabulated} = .89, p < .01$, respectively.

5.2 – Results

5.2.1 - Interview Quality

As in Study 2, the interviewer was aware of the experimental hypotheses. Hence, her expectations may have produced systematic behavioural differences towards participants in different conditions. Such differences might have influenced participant recall (Hayes & Delamothe, 1997). To examine this issue, participants' perceptions about interview quality were obtained, a post-hoc analysis of interview quality was conducted, and the results of these two measures were compared across interview type and age.

Participants' responses (measured along a scale of 1, totally disagree, to 5, totally agree) to the statements: "I felt comfortable and relaxed during the interview" and "I developed good rapport with the interviewer" were added to create an overall rating of perceived interview quality. A univariate ANOVA was performed to determine whether perceived interview quality scores were influenced by interview type or age. No significant differences were found between the mean scores of participants in SI ($M = 9.45$, $SD = .83$), MCI ($M = 9.52$, $SD = .76$), or ECI ($M = 9.38$, $SD = .89$) conditions, $F(2, 94) = .16$, $MSE = .66$, $p = .85$. There were also no differences between the mean scores of young-old ($M = 9.59$, $SD = .71$) and young ($M = 9.31$, $SD = .91$) participants, $F(1, 94) = 2.84$, $MSE = .66$, $p = .10$. Recall was not an artefact of perceived interview quality so this variable was excluded from further analyses.

In addition, an independent rater examined 18 interviews (3 from each condition) for the presence or absence of the following interviewer behaviours: Uses supportive listening; uses appropriate vocabulary; asks witness compatible questions; does not interrupt the witness; does not ask multiple questions; does not ask leading or misleading questions; and does not re-ask a question (see Appendix N for definitions). As in Study 2, a summary measure (Technique Quality) was calculated to reflect the total number of features present in each interview. No significant differences were found when the mean Technique Quality scores in SI ($M = 5.83$, $SD = .98$), MCI ($M = 6.33$, $SD = .82$), or ECI ($M = 5.67$, $SD = .52$) conditions were compared using a univariate ANOVA, F (2, 12) = 1.08, $MSE = .67$, $p = .37$. Similarly, there were no significant differences between the mean scores of young-old ($M = 5.78$, $SD = .83$) and young ($M = 6.11$, $SD = .78$) participants, F (1, 12) = .75, $MSE = .67$, $p = .40$. Technique Quality was therefore excluded from further analyses.

As in Study 2, the rater scored the same set of interviews using a scale of 1 (not at all present) to 7 (very good) for the following measures: Interviewer Polite; Interviewer Friendly; Interview Not Rushed; and Overall Rapport Between Interviewer and Interviewee (see Appendix N). For each interview, a measure of Social Quality was calculated by averaging the scores of the Polite, Friendly, Not Rushed and Overall Rapport items. No significant differences were found between the mean Social Quality scores in SI ($M = 6.21$, $SD = .33$), MCI ($M = 6.13$, $SD = .41$), or ECI ($M = 6.00$, $SD = .52$) conditions with a univariate ANOVA, F (2, 12) = .46, $MSE = .14$, $p = .64$. Similarly, there were no significant differences between the mean scores of young-old ($M = 6.28$, $SD = .32$) and young ($M = 5.94$, $SD = .45$) participants, F (1, 12) = 3.51, $MSE = .14$, $p = .09$. Social Quality was therefore excluded from analyses.

5.2.2 – Gender, Education Level, Interview Duration and Number of Questions

No significant gender differences were observed in the total number of correct, incorrect, or confabulated details reported. In addition, there were no significant gender differences in the completeness or accuracy of recall (all F's < 1.98, all p's > .16)[2]. To determine whether the amount of prior education differed across each experimental condition, a univariate ANOVA was performed to examine the effects of age and interview type on education level. No significant age, F (1, 94) = 2.47, $MSE = 5.16$, $p = .12$, or interview, F (2, 94) = 1.27, $MSE = 5.16$, $p = .29$, effects were found. Consequently, the results presented here are collapsed across gender and level of education.

To establish whether interview duration and the number of questions asked by the researcher differed across experimental conditions, the duration and number of questions in each interview was determined. Two separate univariate ANOVAs

[2] Non-significant results that are not provided in the text of this chapter are presented in Appendix W.

were performed to examine the effects of age and interview type on *interview duration* and *number of questions*, respectively (cf. Hayes & Delamothe, 1997; Holliday, 2003a, b). As in Study 2, interview duration was measured from the end of the rapport-building phase to the end of the interview and excluded time spent explaining CI mnemonics (cf. McMahon, 2000). Questions were defined as specific probes for information. If a question was repeated for clarity, it was only scored the first time it was asked, however if the researcher mistakenly asked the same question twice, both instances were scored.

Interview Duration. A significant main effect for interview type was found, F (2, 94) = 21.49, MSE = 26.67, $\eta_p^2 = .31$, $p < .001$. Tukey's HSD tests indicated that SIs were shorter (M = 19.68 min, SD = 2.95) than MCIs (M = 22.83 min, SD = 4.83), which were shorter than ECIs (M = 27.78 min, SD = 6.92). No main effect was found for age, F (2, 94) = 2.63, MSE = 26.67, p = .11.

Number of questions. A significant main effect was observed for age, F (1, 94) = 7.38, MSE = 36.39, $\eta_p^2 = .07$, $p < .01$. Young adults were asked fewer questions (M = 20.47, SD = 6.09) than young-old adults (M = 23.82, SD = 6.08). No main effect was found for interview type, F (1, 94) = 2.35, MSE = 36.39, p = .10.

Are interview duration and question number covariates of recall? It is possible that superior recall was obtained in certain conditions because of the length of interviews or the number of questions asked in those groups. Consequently, analyses were performed to determine whether interview duration and question number should be included as covariates in all subsequent calculations. Six 2 (age) x 3 (interview) ANCOVAs, using *interview duration* and *number of questions* as covariates, were conducted on the total number of correct, incorrect, and confabulated details reported across the entire interview. A significant effect of *interview duration* was found for the total number of correct, F (1, 92) = 30.06, MSE = 980.77, $\eta_p^2 = .25$, $p < .001$, and confabulated, F (1, 92) = 4.96, MSE = 5.64, η_p^2 = .05, $p < .05$, details recalled. No effect of *interview duration* was found for the total number of incorrect details reported, incorrect, F (1, 92) = 2.84, MSE = 38.37, p = .09. Significant effects of *question number* were not observed for the total number of correct, F (1, 92) = .54, MSE = 980.77, p = .46, incorrect, F (1, 92) = .08, MSE = 38.37, p = .78, or confabulated, F (1, 92) = .95, MSE = 5.64, p = .33, details recalled. *Interview duration*, but not *question number*, was therefore included as a covariate in all further analyses. Throughout this chapter, the effects of age and interview on recall were determined using means that were adjusted to account for the effect of *interview duration.* The true means for all analyses are shown in Appendix X.

5.2.3 –Recall Across Interview Phases

The adjusted mean numbers of correct, incorrect and confabulated details reported across both interview phases was calculated and are shown in Table 5.2. A series of 2 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were performed on the number of correct, incorrect and confabulated Action, Person, Object, and Surrounding details reported, as well as on the total number of correct, incorrect and confabulated details elicited in the entire interview. Tukey's post hoc tests were conducted to investigate significant interactions.

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Table 5.2
Adjusted mean number of correct, incorrect and confabulated details recalled across interview phases, as a function of age and interview (standard errors in brackets)

	Age		Interview		
	Young	Young-old	SI	MCI	ECI
Correct					
Action	31.53 (1.12)	29.11 (1.14)	28.58 (1.51)	30.12 (1.39)	32.25 (1.53)
Person	108.10 (2.72)	91.50 (2.77)	92.87 (3.66)	101.09 (3.36)	105.44 (3.71)
Object	21.05 (0.75)	18.81 (0.77)	17.77 (1.01)	19.71 (0.93)	22.30 (1.03)
Surround	19.48 (0.86)	18.96 (0.88)	17.88 (1.16)	18.91 (1.07)	20.87 (1.18)
Total	180.57 (4.41)	158.49 (4.49)	157.45 (5.94)	169.68 (5.46)	181.46 (6.03)
Incorrect					
Action	0.67 (0.15)	0.80 (0.15)	1.30 (0.20)	0.51 (0.18)	0.41 (0.20)
Person	11.64 (0.70)	9.55 (0.71)	13.18 (0.94)	9.76 (0.86)	8.86 (0.95)
Object	1.20 (0.17)	1.20 (0.17)	1.58 (0.23)	1.28 (0.21)	0.73 (0.23)
Surround	1.10 (0.17)	1.68 (0.17)	1.64 (0.23)	1.55 (0.21)	0.99 (0.23)
Total	14.59 (0.87)	13.24 (0.89)	17.68 (1.17)	13.06 (1.08)	11.00 (1.19)
Confabulated					
Action	0.19 (0.07)	0.15 (0.07)	0.22 (0.09)	0.17 (0.03)	0.12 (0.09)
Person	1.73 (0.29)	1.35 (0.30)	2.59 (0.39)	1.52 (0.36)	0.51 (0.40)
Object	0.26 (0.08)	0.31 (0.08)	0.50 (0.11)	0.18 (0.10)	0.16 (0.11)
Surround	0.45 (0.08)	0.19 (0.08)	0.36 (0.11)	0.29 (0.10)	0.31 (0.11)
Total	2.63 (0.34)	1.99 (0.34)	3.66 (0.45)	2.17 (0.42)	1.11 (0.46)

Correct details.

Age Effects: For the total number of correct details recalled, a main effect was found for age, $F(1, 92) = 12.12$, $MSE = 975.93$, $\eta_p^2 = .12$, $p < .01$, such that young adults reported more correct information ($M = 180.57$) than young-old adults ($M = 158.49$). Main effects of age were also found for the number of correct Person, $F(1, 92) = 18.07$, $MSE = 369.92$, $\eta_p^2 = .16$, $p < .001$, and Object, $F(1, 92) = 4.30$, $MSE = 28.49$, $\eta_p^2 = .04$, $p < .05$, details reported. Young adults recalled more correct Person and Object details ($M_{person} = 108.10$, $M_{object} = 21.05$) than young-old adults ($M_{person} = 91.50$, $M_{object} = 18.81$). No other age effects were found (all F's < 1.24, all p's > .30).

Interview Effects: A main effect was found for the total number of correct details reported, $F(2, 92) = 3.42$, $MSE = 975.93$, $\eta_p^2 = .07$, $p < .05$. More correct information was elicited with the ECI ($M = 181.46$) than with the MCI ($M = 169.68$). Similarly, the MCI elicited more correct information than the SI ($M = 157.45$). In addition, a main effect of interview type was found for the number of correct Object details reported, $F(2, 92) = 4.17$, $MSE = 28.49$, $\eta_p^2 = .08$, $p < .05$. The ECI elicited more correct Object details ($M = 22.30$) than the MCI ($M = 19.71$), which elicited more correct Object details than the SI ($M = 17.77$). No other effects of interview type were found (all F's < 2.62, all p's > .08).

No interaction effects were observed (all F's < 2.47, all p's > .09).

Incorrect details.

Age Effects: Main effects of age were observed for the number of incorrect Person, $F(1, 92) = 4.35$, $MSE = 24.31$, $\eta_p^2 = .05$, $p < .05$, and Surrounding, $F(1, 92) = 5.65$, $MSE = 1.44$, $\eta_p^2 = .06$, $p < .05$, details reported. Young-old adults recalled more incorrect Surrounding details ($M = 1.68$) than young adults ($M = 1.10$). Conversely, young-old adults recalled fewer incorrect Person details ($M = 9.55$) than young adults ($M = 11.64$). No other age effects were found (all F's < 1.17, all p's > .28).

Interview Effects: A main effect of interview type was observed for the total number of incorrect details reported, $F(2, 92) = 7.42$, $MSE = 37.99$, $\eta_p^2 = .14$, $p < .01$, as well as for the number of incorrect Action, $F(2, 92) = 5.77$, $MSE = 1.06$, $\eta_p^2 = .11$, $p < .01$, and Person, $F(2, 92) = 5.29$, $MSE = 24.31$, $\eta_p^2 = .10$, $p = .01$, details reported. In each case, individuals in ECI ($M_{total} = 11.00$, $M_{action} = .41$, $M_{person} = 8.86$) and MCI ($M_{total} = 13.06$, $M_{action} = .51$, $M_{person} = 9.76$) conditions recalled less incorrect information than those in the SI condition (M_{total} = 17.68, M_{action} = 1.30, M_{person} = 13.18). A marginally significant main effect was also found for the number of incorrect Object details reported, F (2, 92) = 3.03, MSE = 1.42, η_p^2 = .06, p = .05. The SI (M = 1.58) and the MCI (M = 1.28) elicited more incorrect Object details than the ECI (M = .73). No effect of interview was found for the number of incorrect Surrounding details reported, F (2, 92) = 2.09, MSE = 1.44, p = .13.

No interaction effects were observed (all F's < 2.67, all p's > .08).

Confabulated details.

Age Effects: A main effect of age was found for the number of confabulated Surrounding details reported, F (1, 92) = 4.94, MSE = .33, η_p^2 = .05, p < .05. Young adults recalled more confabulated Surrounding details (M = .45) than young-old adults (M = .19). No other age effects were observed (all F's < 1.77, all p's > .19).

Interview Effects: A main effect of interview type was observed for the total number of confabulated details, F (2, 92) = 6.86, MSE = 5.64, η_p^2 = .13, p < .01, and the number of confabulated Person details, F (2, 92) = 5.79, MSE = 4.30, η_p^2 = .11, p < .01, reported. In each case, SIs resulted in slightly more confabulated details (M_{total} = 3.66, M_{person} = 2.59) than MCIs (M_{total} = 2.17, M_{person} = 1.52), which elicited more confabulated details than ECIs (M_{total} = 1.11, M_{person} = .51). No main effect of interview type was found for the number of confabulated Action, Object, or Surrounding details reported (all F's < 2.83, all p's > .07).

A significant interaction effect was observed for the number of confabulated Surrounding details recalled, F (2, 92) = 3.79, MSE = .33, η_p^2 = .08, p < .05. Young-old adults recalled fewer confabulated Surrounding details than young adults with the SI (M_{young} = .63, M_{old} = .12) and ECI (M_{young} = .49, M_{old} = .16), although no age differences were found with the MCI (M_{young} = .15, M_{old} = .39). No other interaction effects were found (all F's < 2.37, all p's > .10).

5.2.4 – Free Recall Phase

The adjusted mean numbers of correct, incorrect and confabulated details reported in the free recall phase of interviews are shown in Table 5.3. In order to examine the total amount of correct, incorrect and confabulated information reported during the free recall phase of interviews, and to examine free recall performance on Action, Person, Object, and Surrounding details, a series of separate 2 (age) x 3 (interview) univariate ANCOVAs, using *interview duration* as a covariate, were conducted. Significant interactions were investigated using Tukey's post hoc tests.

Table 5.3

*Adjusted mean number of correct, incorrect and confabulated details recalled in the **free recall** phase, as a function of age and interview* (*standard errors in brackets*)

	Age		Interview		
	Young	Young-old	SI	MCI	ECI
Correct					
Action	26.74 (0.94)	24.76 (0.95)	22.07 (1.26)	25.94 (1.16)	29.23 (1.28)
Person	56.71 (1.74)	50.69 (1.78)	46.46 (2.35)	57.31 (2.16)	57.34 (2.38)
Object	13.79 (0.61)	12.58 (0.62)	11.13 (0.82)	13.41 (0.76)	15.01 (0.84)
Surround	7.16 (0.66)	8.19 (0.68)	5.61 (0.89)	7.17 (0.91)	10.24 (0.91)
Total	104.39 (3.13)	96.20 (3.19)	85.27 (4.21)	103.79 (3.87)	111.82 (4.28)
Incorrect					
Action	0.35 (0.12)	0.55 (0.12)	0.70 (0.16)	0.44 (0.15)	0.23 (0.16)
Person	1.94 (0.26)	2.15 (0.26)	2.01 (0.35)	2.25 (0.32)	1.89 (0.35)
Object	0.40 (0.16)	0.30 (0.16)	0.61 (0.21)	0.18 (0.19)	0.27 (0.21)
Surround	0.24 (0.09)	0.32 (0.09)	0.44 (0.12)	0.16 (0.11)	0.23 (0.12)
Total	2.73 (0.38)	3.32 (0.39)	3.49 (0.51)	3.00 (0.47)	2.59 (0.52)
Confabulated					
Action	0.09 (0.05)	0.07 (0.05)	0.03 (0.07)	0.09 (0.06)	0.13 (0.07)
Person	0.40 (0.12)	0.53 (0.18)	0.35 (0.16)	0.83 (0.14)	0.22 (0.16)
Object	0.09 (0.04)	0.10 (0.04)	0.13 (0.06)	0.09 (0.03)	0.08 (0.06)
Surround	0.06 (0.04)	0.04 (0.04)	0.02 (0.05)	0.07 (0.05)	0.06 (0.05)
Total	0.65 (0.16)	0.74 (0.16)	0.53 (0.21)	1.07 (0.19)	0.48 (0.21)

Correct details.

Age Effects: A marginal main effect of age was found for the total number of correct details, F (1, 92) = 3.32, MSE = 491.10, η_p^2 = .04, p = .06. Similarly, a main effect of age was found for the number of correct Person details reported, F (1, 92) = 5.78, MSE = 152.52, η_p^2 = .06, p < .05. Young adults recalled more correct details (M_{total} = 104.39, M_{person} = 56.71) than young-old adults (M_{total} = 96.20, M_{person} = 50.69). No other age effects were found (all F's < 2.49, all p's > .12).

Interview Effects: Main effects of interview were observed for the total number of correct details, F (2, 92) = 9.10, MSE = 491.10, η_p^2 = .16, p < .001, and for the number of correct Action, F (2, 92) = 6.79, MSE = 43.97, η_p^2 = .13, p < .01, Person, F (2, 92) = 6.84, MSE = 152.52, η_p^2 = .13, p < .01, Object, F (2, 92) = 4.74, MSE = 18.74, η_p^2 = .09, p < .05, and Surrounding, F (2, 92) = 5.79, MSE = 21.99, η_p^2 = .24, p < .01, details recalled. More total correct details and more correct Person details were elicited with ECIs (M_{total} = 111.82, M_{person} = 57.34) than MCIs (M_{total} = 103.79, M_{person} = 57.31). MCIs also elicited more correct details than SIs (M_{total} = 85.27, M_{person} = 46.46). Similarly, more correct Action, Object, and Surrounding details were elicited from ECIs (M_{action} = 29.23, M_{object} = 15.01, M_{surround} = 10.24) and MCIs (M_{action} = 25.94, M_{object} = 13.41, M_{surround} = 7.17) than SIs (M_{action} = 22.07, M_{object} = 11.13, M_{surround} = 5.61).

Age x interview interaction effects were observed for the total number of correct details recalled, F (2, 92) = 6.51, MSE = 479.53, η_p^2 = .12, p < .01, and for the number of correct Action, F (2, 92) = 4.67, MSE = 43.97, η_p^2 = .09, p < .05, and Person, F (2, 92) = 7.23, MSE = 152.52, η_p^2 = .14, p < .01, details recalled. Overall, young-old adults recalled fewer correct details than young adults with the MCI (M_{young} = 112.99, M_{old} = 94.59) and ECI (M_{young} = 121.76, M_{old} = 101.88), but more correct details than young adults with the SI (M_{young} = 78.43, M_{old} = 92.12). Young-old adults recalled fewer correct Action details than young adults with the MCI (M_{young} = 27.30, M_{old} = 24.58) and ECI (M_{young} = 32.50, M_{old} = 25.96), but more correct Action details than young adults with the SI (M_{young} = 20.40, M_{old} = 23.74). Similarly, young-old adults recalled fewer correct Person details than young adults with the MCI (M_{young} = 64.07, M_{old} = 50.55) and ECI (M_{young} = 63.26, M_{old} = 51.41), but more correct Person details than young adults with the SI (M_{young} = 42.81, M_{old} = 50.11). No other interaction effects were found (all F's < 1.42, all p's > .25).

Incorrect details.

No main effects of age or interview type were observed. Similarly, no interaction effects were found (all F's < 1.86, all p's > .16).

Confabulated details.

Age Effects: No age effects were found (all F's < .53, all p's > .47).

Interview Effects: For the total number of confabulated details recalled, a marginally significant main effect was found for interview type, F (2, 92) = 2.84, MSE = 1.23, η_p^2 = .06, p = .06. A significant main effect of interview type was found for confabulated Person details, F (2, 92) = 4.96, MSE = .68, η_p^2 = .10, p < .05. The MCI (M_{total} = 1.07, M_{person} = .83) elicited more confabulated details than either the SI (M_{total} = .53, M_{person} = .35) or ECI (M_{total} = .48, M_{person} = .22). No other interview effects were found (F's < .45, p's > .64).

No interaction effects were found (F's < 2.84, p's > .07).

5.2.5 – Questioning Phase

The adjusted mean numbers of correct, incorrect and confabulated details reported in the questioning phase of interviews are illustrated in Table 5.4. Several 2 (age) x 3 (interview) univariate ANCOVAs, using *interview duration* as a covariate, were performed on the total number of correct, incorrect and confabulated details elicited, as well as on the number of correct, incorrect and confabulated Action, Person, Object, and Surrounding details recalled during the questioning phase of interviews. Significant interactions were investigated with Tukey's post hoc tests.

Table 5.4

Adjusted mean number of correct, incorrect and confabulated details recalled in the ***questioning*** *phase, as a function of age and interview (standard errors in brackets)*

	Age		Interview		
	Young	Young-old	SI	MCI	ECI
Correct					
Action	4.76 (0.44)	4.81 (0.45)	6.32 (0.59)	4.15 (0.54)	3.88 (0.60)
Person	51.36 (1.91)	40.81 (1.95)	46.41 (2.58)	43.75 (2.37)	48.10 (2.62)
Object	7.21 (0.50)	6.23 (0.51)	6.64 (0.68)	6.22 (0.62)	7.30 (0.69)
Surround	12.57 (0.64)	10.81 (0.65)	12.11 (0.86)	11.72 (0.79)	11.23 (0.88)
Total	76.00 (2.67)	62.64 (2.72)	71.61 (3.60)	65.84 (3.31)	70.51 (3.65)
Incorrect					
Action	0.32 (0.08)	0.27 (0.08)	0.64 (0.10)	0.07 (0.09)	0.18 (0.10)
Person	9.70 (0.62)	7.42 (0.63)	11.17 (0.83)	7.54 (0.76)	6.97 (0.84)
Object	0.98 (0.15)	0.90 (0.15)	1.23 (0.20)	1.09 (0.19)	0.49 (0.20)
Surround	0.87 (0.15)	1.36 (0.15)	1.20 (0.20)	1.39 (0.18)	0.76 (0.20)
Total	11.86 (0.70)	9.95 (0.71)	14.24 (0.94)	10.09 (0.87)	8.39 (0.96)
Confabulated					
Action	0.10 (0.05)	0.08 (0.05)	0.91 (0.07)	0.09 (0.06)	0.00 (0.07)
Person	1.30 (0.26)	0.72 (0.26)	2.13 (0.35)	0.48 (0.32)	0.42 (0.35)
Object	0.16 (0.06)	0.19 (0.06)	0.35 (0.08)	0.06 (0.08)	0.11 (0.09)
Surround	0.40 (0.08)	0.14 (0.08)	0.32 (0.10)	0.19 (0.10)	0.30 (0.11)
Total	1.97 (0.29)	1.12 (0.30)	2.99 (0.39)	0.82 (0.36)	0.82 (0.40)

Correct details.

Age Effects: A main effect of age was found for the total number of correct details, F (1, 92) = 12.10, MSE = 358.48, η_p^2 = .12, p < .01, and for the number of correct Person details, F (1, 92) = 14.71, MSE = 183.77, η_p^2 = .14, p < .001. Young adults recalled more correct information (M_{total} = 76.00, M_{person} = 51.36) than young-old adults (M_{total} = 62.64, M_{person} = 40.81). A marginally significant effect of age was found for the number of correct Surrounding details reported, F (1, 92) = 3.63, MSE = 20.69, η_p^2 = .04, p < .06. Young adults recalled more correct Surrounding details (M = 12.57) than young-old adults (M = 10.81). No other main effects of age were observed (all F's < 1.83, all p's > .18).

Interview Effects: A main effect of interview was observed for the number of correct Action details recalled, F (2, 92) = 4.78, MSE = 9.59, η_p^2 = .09, p < .05. The SI (M = 6.32) elicited more correct Action details than the MCI (M = 4.15) or ECI (M = 3.88). No other effects of interview were found (all F's < .87, all p's > .2).

A marginally significant interaction effect was observed for the total number of correct Action details, F (2, 92) = 3.13, MSE = 9.59, η_p^2 = .06, p = .05. Young adults recalled more correct Action details with the SI than with either the MCI or ECI (M_{SI} = 7.40, M_{MCI} = 3.56, M_{ECI} = 3.33), although no such differences were found for young-old adults (M_{SI} = 5.25, M_{MCI} = 4.75, M_{ECI} = 4.44). No other interaction effects were found (F's < .81, p's > .45).

Incorrect details.

Age Effects: Main effects of age were observed for incorrect Person details, F (1, 92) = 6.59, MSE = 19.15, η_p^2 = .07, p < .05, and a marginally significant effect of age was observed for the total number of incorrect details reported, F (1, 92) = 3.61, MSE = 24.53, η_p^2 = .04, p = .06. Young adults recalled more incorrect information (M_{total} = 11.86, M_{person} = 9.70) than young-old adults (M_{total} = 9.95, M_{person} = 7.42). A main effect of age was also found for incorrect Surrounding details, F (1, 92) = 5.55, MSE = 1.07, η_p^2 = .07, p < .05, such that young-old adults reported a greater number of incorrect Surrounding details (M = 1.36) than young adults (M = .87). No main effects of age were observed for the number of incorrect Action, or Object details reported (all F's < .20, all p's > .65).

Interview Effects: A main effect of interview was found for the total number of incorrect details reported, F (2, 92) = 8.91, MSE = 24.53, η_p^2 = .16, p < .001, as well as for incorrect Action, F (2, 92) = 9.20, MSE = .28, η_p^2 = .17, p < .001, and incorrect Person, F (2, 92) = 6.91, MSE = 19.15, η_p^2 = .13, p < .01, details. The SI produced more incorrect information (M_{total} = 14.24, M_{action} = .64, M_{person} = 11.17) than either the MCI (M_{total} = 10.09, M_{action} = .07, M_{person} = 7.54) or ECI (M_{total} = 8.39, M_{action} = .18, M_{person} = 6.97). A marginally significant main effect of interview was also found for the number of incorrect Object details reported, F (2, 92) = 3.22, MSE = 1.12, η_p^2 = .07, p = .05. The ECI (M = .49) elicited fewer incorrect Object details than either the SI (M = 1.23) or MCI (M = 1.09). No main effect of interview was observed for incorrect Surrounding details, F (2, 92) = 2.65, MSE = 1.07, p = .08.

An interaction effect was found for the total number of incorrect details, F (2, 92) = 5.25, MSE = 24.53, η_p^2 = .10, p < .01, as well as for the number of incorrect Person details recalled, F (2, 92) = 4.23, MSE = 19.15, η_p^2 = .08, p < .05. Overall, young adults recalled more incorrect details with the SI than with the MCI or ECI (M_{SI} = 17.37, M_{MCI} = 10.56, M_{ECI} = 7.67), although no such differences were observed for young-old adults (M_{SI} = 11.11, M_{MCI} = 9.63, M_{ECI} = 9.12). Young adults recalled more incorrect details in the SI than young-old adults (M_{young} = 17.37, M_{old} = 11.11). This difference was not seen with MCIs (M_{young} = 10.56, M_{old} = 9.63) or ECIs (M_{young} = 7.67, M_{old} = 9.12). In addition, young adults recalled more incorrect Person details with the SI than with the MCI or ECI (M_{SI} = 13.98, M_{MCI} = 8.46, M_{ECI} = 6.67), but no such differences were found for young-old adults (M_{SI} = 8.37, M_{MCI} = 6.63, M_{ECI} = 7.27). Young adults also recalled more incorrect Person details with the SI than young-old adults (M_{young} = 13.98, M_{old} = 8.37). This age difference was not apparent with the ECI (M_{young} = 6.67, M_{old} = 7.27). No other interaction effects were found (F's < 2.41, p's > .10).

Confabulated details.

Age Effects: A main effect of age was found for the number of confabulated Surrounding details, F (1, 92) = 5.76, MSE = .3, η_p^2 = .06, p < .05. Young adults recalled more confabulated Surrounding details (M = .40) than young-old adults (M = .14). A marginally significant effect was also observed for the total number of confabulated details, F (1, 92) = 4.09, MSE = 4.29, η_p^2 = .04, p = .05. Young adults recalled more confabulated details (M = 1.97) than young-old adults (M = 1.12). No other age effects were found (F's < 2.45, p's > .12).

Interview Effects: Main effects of interview were found for the total number of confabulated details reported, F (2, 92) = 9.69, MSE = 4.29, η_p^2 = .17, p < .01, as well as for confabulated Person, F (2, 92) = 7.46, MSE = 3.30, η_p^2 = .14, p < .01, and Object, F (2, 92) = 3.54, MSE = .19, η_p^2 = .07, p < .05, details. SI's resulted in more confabulated information (M_{total} = 2.99, M_{person} = 2.13, M_{object} = .35) than MCIs (M_{total} = .82, M_{person} = .48, M_{object} = .06) or ECIs (M_{total} = .82, M_{person} = .42, M_{object} = .11). No other main effects of interview (all F's < 1.79, all p's > .17) and no interaction effects (all F's < 2.24, all p's > .11) were found.

5.2.6 – Uncertain Responses

The adjusted mean numbers of correct, incorrect and confabulated uncertain responses elicited in each condition are shown in Table 5.5. A series of 2 (age) x 3 interview) univariate ANCOVAs, using *interview duration* as a covariate, were performed to examine the total amount of correct information reported across and within interview phases. Similarly, 2 (age) x 3 (interview) univariate ANCOVAs (covariate: *interview duration*) were used to examine recall of Action, Person, Object, and Surrounding details. Tukey's HSD tests were conducted to investigate significant interactions. Across the entire interview, and across each interview phase, no significant differences were found in the number of uncertain correct, incorrect or confabulated details reported as a function of age or interview type (all F's < 2.76, all p's > .10).

Table 5.5

Adjusted mean number of correct, incorrect and confabulated details recalled with ***uncertainty****, as a function of age and interview* (*standard errors in brackets*)

	Age		Interview		
	Young	Young-old	SI	MCI	ECI
FR Phase					
Correct	0.21 (0.09)	0.25 (0.09)	0.24 (0.12)	0.14 (0.11)	0.32 (0.12)
Incorrect	0.13 (0.06)	0.10 (0.06)	0.13 (0.08)	0.16 (0.08)	0.05 (0.08)
Confabulated	0.06 (0.03)	0.02 (0.04)	0.01 (0.05)	0.09 (0.04)	0.05 (0.04)
Q Phase					
Correct	0.91 (0.15)	1.10 (0.15)	0.93 (0.20)	1.12 (0.18)	0.96 (0.20)
Incorrect	0.77 (0.14)	0.70 (0.14)	0.56 (0.18)	0.86 (0.17)	0.79 (0.18)
Confabulated	0.29 (0.07)	0.00 (0.07)	0.07 (0.09)	0.22 (0.08)	0.15 (0.09)
Both Phases					
Correct	1.12 (0.17)	1.31 (0.18)	1.14 (0.23)	1.23 (0.21)	1.28 (0.24)
Incorrect	0.90 (0.15)	0.80 (0.15)	0.69 (0.20)	1.02 (0.18)	0.84 (0.20)
Confabulated	0.27 (0.07)	0.10 (0.07)	0.06 (0.10)	0.31 (0.09)	0.20 (0.10)

Note. FR = free recall, Q = questioning

5.2.7 – Accuracy of Recall

As in Study 2, recall accuracy was determined by dividing the number of *correct* details reported by the *total* number of details reported. Mean accuracy scores were determined for both interview phases and for the entire interview (see Table 5.6). Three separate 2 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were conducted to determine whether accuracy in the free recall phase, questioning phase or entire interview was influenced by age or interview. Significant interactions were examined using Tukey's HSD tests.

Table 5.6

Adjusted mean accuracy of recall scores, as a function of age and interview (standard errors in brackets)

	Free Recall Phase	Questioning Phase	Both Phases
Age			
Young	0.97 (0.00)	0.85 (0.01)	0.91 (0.00)
Young-old	0.96 (0.00)	0.85 (0.01)	0.91 (0.01)
Interview			
SI	0.96 (0.01)	0.81 (0.01)	0.88 (0.01)
MCI	0.96 (0.01)	0.86 (0.01)	0.92 (0.01)
ECI	0.98 (0.01)	0.88 (0.01)	0.93 (0.01)

Across interview phases, a main effect was found for interview, F (2, 92) = 18.11, MSE = .001, η_p^2 = .28, p < .001. The MCI (M = .92) and ECI (M = .93) resulted in a higher accuracy rate than the SI (M = .88). No main effect was found for age, F (1, 92) = .62, MSE = .001, p = .43, although a significant Interview x Age interaction was observed, F (2, 92) = 6.25, MSE = .001, η_p^2 = .12, p < .01. Young-old adults (M = .90) were more accurate than young adults (M = .86) when given a SI, although no age differences were present in the MCI (M_{young} = .92, $M_{young\text{-}old}$ = .91) or ECI conditions (M_{young} = .94, $M_{young\text{-}old}$ = .93).

When accuracy rates in the free recall phase were examined, no main effects of interview type or age were observed. Similarly, no interaction effects were observed (all F's < 2.46, all p's > .15). In the questioning phase, a main effect of interview was found, F (2, 92) = 8.03, MSE = .001, η_p^2 = .15, p < .01. Details elicited in the questioning phase of MCIs (*M* = .86) and ECIs (*M* = .88) were more accurate than those generated in the questioning phase of SIs (*M* = .81). A significant interaction effect was also found in the questioning phase, $F(2, 92) = 3.24$, $MSE = .001$, $\eta_p^2 = .07$, $p < .05$. For young adults, ECI recall was more accurate than MCI recall, which was more accurate than SI recall ($M_{ECI} = .89$, $M_{MCI} = .86$, $M_{SI} = .79$). However, no such differences were found for young-old adults ($M_{ECI} = .86$, $M_{MCI} = .86$, $M_{SI} = .83$). Analyses also revealed that older adults were more accurate than young adults in the SI condition ($M_{older} = .83$, $M_{young} = .79$), but no age differences were observed in the MCI ($M_{older} = .86$, $M_{young} = .86$), or ECI ($M_{older} = .86$, $M_{young} = .89$) conditions. No main effect of age was found, $F(1, 92) = .16$, $MSE = .001$, $p = .69$.

5.2.8 – Completeness of Recall

As in Study 2, completeness of recall was determined by dividing the total number of *correct* details reported by the total number of possible *correct* details (i.e., the 699 details listed in the summary template, see Appendix L). Adjusted mean completeness scores were determined within and across interview phases, and are presented in Table 5.7. To examine whether completeness of recall scores were influenced by interview or age, three 2 (age) x 3 (interview) ANCOVAs, using *interview duration* as a covariate, were performed. Significant differences were examined using Tukey's HSD tests.

Table 5.7

Adjusted mean completeness of recall scores, as a function of age and interview (standard errors in brackets)

	Free Recall Phase	Questioning Phase	Both Phases
Age			
Young	0.15 (0.01)	0.11 (0.00)	0.26 (0.01)
Young-old	0.14 (0.01)	0.09 (0.00)	0.23 (0.01)
Interview			
SI	0.12 (0.01)	0.10 (0.01)	0.22 (0.01)
MCI	0.15 (0.01)	0.09 (0.01)	0.24 (0.01)
ECI	0.16 (0.01)	0.10 (0.01)	0.26 (0.01)

Across interview phases, main effects of interview, F (2, 92) = 3.42, MSE = .002, η_p^2 = .07, p < .05, and age, F (1, 92) = 12.12, MSE = .002, η_p^2 = .07, p < .01, were observed. Accounts elicited with the ECI (M = .26) were more complete than accounts elicited with the MCI (M = .24), which were more complete than those elicited with the SI (M = .22). The recall of young adults (M = .26) was also more complete than that of young-old adults (M = .23). N interaction effect was observed, F (2, 92) = 2.47, MSE = .002, p = .09

In the free recall phase, a main effect of interview was found, F (2, 92) = 9.10, MSE = .001, η_p^2 = .16, p < .001. ECIs (M = .16) and MCIs (M = .15) elicited more complete information than SIs (M = .12). A significant interaction effect was also observed, F (2, 92) = 6.04, MSE = .001, η_p^2 = .12, p < .01. Young adults were more complete than young-old adults when given the MCI (M_{young} = .16, M_{old} = .14), and ECI (M_{young} = .17, M_{old} = .15), but young-old adults were more complete than young adults when given the SI (M_{young} = .11, M_{old} = .14). No main effect of age was found, F (1, 92) = 3.32, MSE = .001, p = .07.

Finally, a main effect of age was observed for completeness of recall in the questioning phase, F (1, 92) = 12.10, MSE = .001, η_p^2 = .12, p < .01. Young adults (M = .11) were more complete than young-old adults (M = .09). No other effects were found in the questioning phase (all F's < .87, all p's > .42).

5.3 – Discussion

The aims of the present study were to: 1) examine the quantity and quality of adults' reports about a witnessed event as a function of interview type and age, and 2) test the strength of the results found in Study 2, by determining whether these were replicable. In the following discussion, findings relating to age and interview condition will be considered.

5.3.1 – Comparing the Recall of Young and Young-old Adults

As predicted, young-old participants were less proficient at recalling information than young participants. This observation is consistent with previous research about the eyewitness (e.g., Yarmey & Kent, 1980; Yarmey & Yarmey, 1993) and general (e.g., Nyberg et al., 1996) recall ability of older adults. Overall, young adults reported more correct information than young-old adults, which replicates the results of Study 2. This effect was attributed primarily to the questioning phase of interviews and to Person-related details. Overall, the free recall reports of young-old adults contained only marginally more correct details than those of young adults, and young-old adults' recall of correct Action, Object, and Surrounding details were not significantly different from young adults. As discussed in Section 4.3.1, this result is consistent with a meta-analysis by Verhaeghen et al. (1993), which found that young adults were more proficient at freely recalling written stories than young-old adults.

No overall age differences were observed in the number of incorrect or confabulated details reported (cf. Study 2). This supports the claim that the recall difficulties experienced by young-old adults are due to errors of omission rather than errors of commission. Unlike in Study 2, however, young adults recalled more incorrect Person details and more confabulated Surrounding details than young-old adults. These effects stemmed primarily from the questioning phase of interviews. Such results are encouraging as they suggest that older adults do not always perform worse than younger adults.

Also unlike in Study 2, young-old adults reported a greater number of incorrect Surrounding details than young adults. In addition, no age-related increases in the recall of incorrect Object details were found. Many of the Object and Surrounding details in the to-be-remembered film could be classified as peripheral (e.g., lamp post, other cars in the car park), rather than central (e.g., the suspects) information. The discovery that Object and Surrounding details caused young-old adults the most difficulty overall implies that memory for peripheral information is more sensitive to age-related decline than memory for central information. Although little research has tested this argument directly, it is consistent with age-related memory decline theories. For example, the Attentional Capacity (Kahneman, 1973) and the Reduced Working Memory Capacity (Park et al., 1996) theories maintain that older adults possess fewer cognitive resources than young adults and are less able to process many details simultaneously. Information that was central to the observed incident could have been deemed important by young-old participants and attended to at the expense of peripheral information. Interestingly, however, Study 2 found that young and young-old adults did not differ in terms of the number of correct peripheral details recalled across the entire interview. Rather, young-old adults recalled fewer correct relevant details than young adults (see Appendix T, Table T.10). At first glance, this finding suggests that young and young-old adults are equally adept at recalling peripheral information, and contradict the argument that young-old adults have difficulty recalling Object and Surrounding details because these are peripheral items. However, it is important to recognize that in Study 2 the terms 'relevant' and 'peripheral' were defined by police officers. It is possible that officers' definition of these terms is somewhat different from that of participants (e.g., participants may not be aware of all the different legal points that need to be proven).

Even though young-old adults recalled fewer correct details than young adults, the present study found that recall accuracy was not significantly different across the two age groups. In Study 2, however, young-old adults were slightly less accurate than young adults. When the accuracy values across the two studies were compared, the accuracy of young adults remained constant (Study 2 = .92; Study 3 = .91). However, young-old adults in Study 2 were less accurate than those in the present study (.88 versus .91, respectively). This discrepancy could partly stem from individual differences between the two groups of young-old adults (e.g., some young-old adults from Study 2 may have achieved lower accuracy scores because they were depressed, whereas none of the young-old adults in the present study were depressed). This difference may also simply be the result of normal variance between experiments.

Consistent with Study 2 and previous eyewitness research (e.g., List, 1986; Yarmey, 2000), the recall of young-old adults was less complete than young adults. Again, most of this difference stemmed from the questioning phase of interviews, which indicates that young-old adults have greater difficulty answering questions about a to-be-remembered event. Conversely, young-old adults may have remembered fewer overall details than young adults, so had fewer new details to report during the questioning phase.

5.3.2 – Interviewing Young and Young-Old Adults with the ECI and MCI

As predicted, the ECI and MCI elicited more correct details than the SI. Specifically, the ECI increased correct recall by 20% for young adults and 6% for young-old adults. The advantage of the MCI was somewhat smaller, however. The MCI increased correct recall by 13% for young adults and by only 1% for older adults[1]. Although the recall improvements for young adults are almost identical to those obtained in Study 2 (ECI = 20%, MCI = 14%), improvements for young-old adults were much less substantial than in Study 2 (ECI = 27%, MCI = 17%). Some of the cross-study variability found for young-old adults may be due to the fact that each study used a different distraction task. Spending 30 minutes in conversation with young-old participants prior to interviewing (Study 2) may have enhanced rapport and increased the beneficial effects of the ECI and MCI. Young adults may not have required extensive rapport building, because they were approximately the same age as the interviewer or because they were used to participating in experimental studies. Interestingly, Holliday and Albon (2004) reported that children (4-5-years) who were given an Enhanced Rapport MCI that included 15-minutes of pre-interview rapport-building did not recall more correct information than children given a MCI that included only 10-minutes of pre-interview rapport-building. However, it longer rapport-building phases (such as the 30-minute phase used in Study 2) might be necessary for rapport to significantly influence interview performance. Similarly, it may be that rapport with children, young adults and young-old adults is achieved in fundamentally different ways and takes a different length of time to establish.

As expected, the present study demonstrated that young adults outperformed young-old adults in the MCI and ECI conditions. Interestingly, however, no age differences were observed in the SI condition. This is contrary to Study 2, in which young adults outperformed older adults irrespective of the interview they were given. One explanation for this difference could be that young adults in the SI condition of the present study were less motivated than participants in other conditions. Young adults were recruited using a scheme that allocated course credit for participation. According to this scheme, students are required to participate in a set number of experiments each year. At the end of the academic year (which is when the present study was conducted) students often show little enthusiasm for the studies they participate in. Indeed, several of the young participants in the present study indicated that they were only continuing to volunteer to fulfil course requirements. The MCI and ECI, which might be considered more unusual and interesting than the SI since they involve techniques that are not present in a traditional interview (e.g., describing

[1] These figures are based on adjusted means obtained from the Age x Interview interaction analysis performed on the total number of correct details elicited across interview phases.

the event in reverse order), may have kept young adults challenged and interested in the task. Young-old adults, however, had often never participated in research before and may therefore have been equally motivated in each condition.

For both age groups the beneficial effects of the ECI and MCI stemmed primarily from the free recall phase, rather than the questioning phase, of interviews (cf. Study 2). Indeed, the amount of correct information reported for all detail types (Action, Person, Object, Surrounding) was greater in the free recall phase of the ECI and MCI than in the same phase of the SI, whereas interview type had little effect on recall in the questioning phase. In the questioning phase, only the number of correct Action details differed according to interview type, such that more Action details were elicited in the ECI and MCI than in the SI. The observation that the free recall phase contributes more to the CI's facilitative effects than the questioning phase is consistent with the work of Holliday and colleagues (Holliday, 2003a, b; Holliday & Albon, 2004), but contrary to the findings of Memon et al. (1997b) and Milne and Bull (2003). However, these differences may largely be explained by methodological differences between studies (e.g., CI mnemonics were presented at different stages of the interview and different to-be-remembered events were used).

When specific detail types were considered, the ECI and MCI elicited more correct Object details than the SI for both age groups. Interestingly, this differs from Study 2, in which the ECI and MCI improved recall across *every* detail type. Such discrepancy implies that differences in the types of details recalled with the CI are not solely due to differences in the to-be-remembered event, as Akehurst et al. (2003) suggested. Instead, the types of details recalled by participants may depend more on their individual schemas and expectations about the event. Nevertheless, it should also be noted that the trend of the means for correct Action, Person, and Surrounding details in the present study (i.e., more correct details recalled with the ECI and MCI) was the same as that in Study 2.

As in Study 2, the SI elicited more incorrect information than the ECI and MCI in the questioning phase, but not in the free recall phase. This trend was observed for both age groups. Taken together, the results of Studies 2 and 3 demonstrate that aspects of the CI's questioning phase (e.g., the use of mental imagery) reduce the reporting of incorrect information. When both interview phases were combined, the present study found that the SI elicited slightly more incorrect details than either the ECI or MCI. In contrast, Study 2 found no significant differences in the number of incorrect details reported in each interview. Nevertheless, the results of both studies are favourable for the ECI and MCI, as they suggest that these interviews either reduce, or do not alter the amount of incorrect information recalled by participants, while simultaneously increasing the amount of correct information recalled. These findings are inconsistent with the meta-analysis performed by Köhnken et al. (1999), which revealed that the CI produces significantly more incorrect details than control (Structured and Standard) interviews. As Köhnken et al. (1999) noted, however, differences in incorrect details between the CI and control interviews are highly variable across studies, ranging from 40% *fewer* incorrect details being reported with the CI than control interviews (Saywitz et al., 1992), to 313% *more* incorrect details being reported with the CI (Hernandez-Fernaud & Alonso-Quecuty, 1997). In light of this variability, the results of Studies 2 and 3 are not unusual.

Analysis of the number of confabulated details reported in each interview condition revealed that for both age groups the SI elicited significantly more confabulated details than either the ECI or MCI. Such findings support the results of Study 2, but are inconsistent with previous research which has indicated that there is either no significant difference in the amount of confabulated information recalled with the CI and SI (e.g., Akehurst et al., 2003; Memon et al., 1997a), or that the CI elicits slightly more confabulated details than the SI (e.g., Brown & Geiselman, 1990; Köhnken et al., 1992). Although the reason for this discrepancy is unclear, subtle differences in the coding schemes used by different researchers[2] may be a contributing factor. However, the fact that very few confabulated details were reported in each interview condition (ranging from 1.56 to 3.27 details, on average) indicates that confabulations have a negligible impact on overall testimony.

For both age groups, the ECI and MCI resulted in information that was more accurate than the SI (cf. Study 2). The sizes of the accuracy rates observed in Studies 2 and 3 are similar to, but slightly higher than the rates reported by other researchers (e.g., Fisher et al., 2002; Köhnken et al., 1999; McMahon, 2000). This difference could reflect the fact that responses involving uncertainty (e.g., "I'm not sure, he *might* have...") were not included in the present accuracy analyses. A more detailed

[2] For example, in the present research, if a participant stated that one of the people from the video had a hat, when in fact they did not, it was scored as a confabulation. Other researchers may have scored the same detail as being incorrect. Inconsistencies like this are difficult to avoid, since few researchers publish their complete coding scheme.

analysis of free recall and questioning phase accuracy revealed the questioning phase was primarily responsible for improving ECI and MCI accuracy. This suggests that the techniques used in the questioning phase of CIs (e.g., mental imagery instructions) are beneficial for recall. Overall, it was observed that the free recall phase of all interviews resulted in more accurate information than the questioning phase (Table 5.6). This is consistent with the work of Milne & Bull (2003) and indicates that the MCI and ECI enhanced recall accuracy in the phase that was most in need of improvement (i.e., the questioning phase).

When completeness scores were analysed across interview condition, recall with the ECI was more complete than that with the MCI, which was more complete than that with the SI, for both age groups. The observation that the CI improves recall completeness is consistent with the results of Study 2, the work of Holliday (2003a, b) and Holliday and Albon (2004). As in Study 2, this effect was primarily due to the free recall phase of interviews, since no effect of interview type was observed on the completeness of recall in the questioning phase.

5.3.3 - Comparing the MCI and ECI

As in Study 2, it was found that for both young and young-old adults the ECI elicited slightly more correct information than the MCI with no decrease in recall accuracy. This supports the value of the *change perspective* mnemonic (the only aspect of the two interviews to differ) and suggests that it consistently improves recall by the same amount. The observation that the *change perspective* mnemonic benefits recall corroborates research by Memon et al. (1996) and Milne and Bull (2002), which revealed that each CI mnemonic either contributes incrementally to the CI's overall effect or interacts with various other CI mnemonics to enhance recall. In addition, the results of the present study indicate that although older adults may indeed be worse than young adults at changing perspectives (e.g., Herman & Coyne, 1980), the *change perspective* instruction may still exert a positive effect within this age group.

5.4 – Chapter Summary

The present study replicated the results obtained in Study 2 by examining the quantity and quality of recall as a function of interview (ECI, MCI, SI) and age (18-31-years, 60-75-years). As in Study 2, young adults recalled more correct information than young-old adults across all interview types. It was also observed that for both age groups, recall elicited with the ECI and MCI was more complete and accurate than that elicited with the SI. Furthermore, the ECI elicited more correct information than the MCI, without compromising recall accuracy. These results were obtained despite the fact that education level, depression and the degree of rapport between the interviewer and interviewee, were accounted for.

Taken together, the results of Studies 2 and 3 demonstrate that the ECI and MCI facilitate the recall of young-old and old-old adults. It is important to recognise, however, that these studies focused entirely on individuals who are not cognitively impaired. Many of the older adults who witness a crime have cognitive impairments that may hinder their ability to remember the incident (Coyne, 2001). For example, compared to age-matched controls, individuals with Alzheimer's disease recall fewer correct details about a story that was presented immediately, 10 minutes, or 30 minutes before test (e.g., Chapman, White, & Storandt, 1997; Hodges & Patterson, 1995). Impaired individuals may also take longer to encode, understand and store information, and may have difficulty accessing stored information at a later point (Bull, 1995). To date, however, no published studies have examined the eyewitness recall of impaired older adults or established whether CI techniques enhance the recall of this group. To help address this dearth of information, the study described in the following chapter will extend the findings from Studies 2 and 3 and determine whether the ECI and MCI are able to improve the recall of older adults who show signs of cognitive impairment, as measured by the MMSE (Folstein et al., 1975).

Chapter VI:

Cognitively Impaired Older Adults and the Cognitive Interview

The studies described in the preceding two chapters demonstrated that the ECI and MCI enhanced the recall of both young-old (60-74-years) and old-old (75-95-years) adults who do *not* show signs of cognitive impairment. To date, however, no published research has examined the eyewitness performance of older adults who have cognitive impairments, even though this group is particularly susceptible to crimes like abuse and neglect (Coyne, 2001; Lachs et al., 1997). Such individuals may also be the only witnesses to crimes against others with cognitive impairment (e.g., fellow group home residents; Milne & Bull, 2001).

Cognitive impairments are relatively common among older adults. For example, according to the Alzheimer's Society UK (2000), 2% of people between the ages of 65- and 70-years, 5% of people between the ages of 70- and 80-years, and 20% of those over the age of 80-years, have been diagnosed with some form of dementia. Although dementia is a frequent cause of cognitive impairment among older adults, it is not the only cause. As noted in Chapter V, depression can also diminish older adults' cognitive performance (Veiel, 1997). In addition, insomnia (Cricco et al., 2001), poor social networks (Zunzunegui et al., 2003), surgery (Ancelin et al., 2001), medication (Schaeufele et al., 2002), and heart disease (Barbe et al., 2002) have been implicated in the cognitive decline of older adults.

The present study extended the work conducted in Studies 2 and 3 by determining whether the ECI and MCI facilitated recall among older adults who scored low (< 27) on a test to assess cognitive decline (MMSE; Folstein et al., 1975). The MMSE determines the presence and severity of cognitive impairment. Use of this test alone is not, however, sufficient for diagnosing the cause of impairment. For example, the MMSE does not distinguish between older adults with affective disorders (e.g., depression) and those with dementia (Folstein et al., 1975).

The analyses described in the present study are based on the interviews of old-old participants from Study 2 who scored 26 or under on the MMSE. The recall of this cognitively impaired group was compared against a control group of non-impaired old-old adults (i.e., scoring 27-30 on the MMSE). Control individuals were also from Study 2, thus ensuring that the conditions experienced by control and low MMSE groups were as similar as possible.

To date, only three published studies have tested the CI with cognitively impaired individuals (Brown & Geiselman, 1990; Milne et al., 1999; Milne & Bull, 1996). Brown and Geiselman (1990) reported that when a CI was administered to learning disabled adults (i.e., those with impaired social and intellectual functioning) it elicited 32% more correct information than a SI, with no corresponding increase in the recall of incorrect information. In addition, while the CI resulted in a slight increase in confabulated information, the accuracy rates of each interview were similar. When the recall performance of the Brown and Geiselman sample was compared to individuals in the general population (from Geiselman et al., 1985), learning disabled participants were found to recall fewer correct details overall. Interestingly, however, both groups demonstrated similar levels of accuracy. Nevertheless, differences between the Brown and Geiselman (1990) and Geiselman et al. (1985) studies (e.g., the use of different interviewers) may make such inter-study comparisons inappropriate (Milne et al., 1999; Milne & Bull, 2001).

Milne et al. (1999) examined the effects of an ECI versus a Structured Interview (SI) on the recall of adults with and without learning disabilities one day after viewing a film of a child being struck by a car. Individuals from the general population (19-59-years) recalled more correct Person, Action, Object, and Surrounding information and made fewer confabulations (especially concerning Person and Object details) than those with learning disabilities (19-62-years). The recall of learning disabled participants was also less complete than that of participants from the general population. Importantly, however, it was observed that the learning disabled recalled 35% more correct information when given a CI than when given a SI, with no overall differences in accuracy. Nevertheless, the CI resulted in significantly more confabulated Person details than the SI when used with this group.

The final published study to examine the use of the CI with cognitively impaired individuals involved children (7-10-years) with mild learning disabilities (Milne & Bull, 1996). As in previous studies (Brown & Geiselman, 1990; Milne et al., 1999), a CI increased the amount of correct Person, Action and Surrounding information recalled by this group, and resulted in a higher overall accuracy rate than a SI.

In the current study, it was predicted that older adults with low MMSE scores (0-26) would recall fewer correct details (of the Action, Person, Object, and

Surrounding types) than those with high MMSE scores (27-30) (cf. Brown & Geiselman, 1990; Milne et al., 1999). It was also predicted that the recall of individuals with low MMSE scores would be less complete, and would contain more confabulated details than the recall of individuals with high MMSE scores (cf. Milne et al., 1999). Furthermore, it was expected that the ECI and MCI would improve recall accuracy and completeness for both groups by increasing the number of correct Action, Person, Object, and Surrounding details reported.

6.1 – Method

6.1.1 – Participants

The participants included in the present study were recruited in Study 2 from local community organizations, social clubs for senior citizens, newspaper advertisements (see Appendix F), radio announcements, and leaflets (see Appendix F) posted around the city of Canterbury and the university. Participants were excluded if their hearing was too poor to enable conversation, if they reported that they were visually impaired, or if they reported that they were unable to read. In total, 41 of these participants achieved low (below 27) MMSE scores (16 males, 25 females; aged 63-96-years, M = 81.56, SD = 7.85). To prevent the effects of age on recall (e.g., List, 1986; Studies 2 & 3) from confounding any effects of MMSE score on recall, old-old adults with low MMSE scores were compared to old-old adults with high MMSE scores. Young-old adults were excluded from analyses because there were too few low scoring young-old adults (N = 5) to make meaningful comparisons with high scoring young-old adults. The final sample was comprised 51 participants (8 males, 43 females) aged 75-95-years (M = 81.78, SD = 4.83) who scored high on the MMSE (scores ranged from 27-30, M = 28.08, SD = .98), and 36 participants (14 males, 22 females) aged 75-96-years (M = 83.69, SD = 5.55) who scored low on the MMSE (scores ranged from 17-26, M = 22.92, SD = 2.75).

6.1.2 – Materials

As described in Study 2, a 2min 40sec film was shown individually to participants. The video depicted three individuals attempting to break into a car in a car park. The purported thieves are noticed by passers-by but are not stopped until the owners of the car return (see Appendix G for a description of the video). Each participant was given a SI, MCI or ECI. SIs followed the guidelines identified by

Köhnken (1993) and the *Achieving Best Evidence* report (Home Office, 2001), whereas ECIs followed the protocols outlined by Fisher and Geiselman (1992). MCIs were identical to ECIs, except that the *change perspectives* technique was omitted (see Appendix H for a detailed description of the interviews).

The MMSE (see Appendix E; Folstein et al., 1975) was used to evaluate the cognitive status of participants. This 5-10 minute test consists of 20 questions to assess orientation, attention, language abilities, immediate recall, short-term recall and the ability to follow verbal and written commands (Crum et al., 1993). A score of 30 can be achieved and scores of 0-26 are often associated with cognitive impairment (Feinberg & Whitlatch, 2001; Kalman et al., 1995).

6.1.3 – Design

A 2 (MMSE: low, high) x 3 (interview: SI, MCI, ECI) factorial design was used. Each high MMSE interview condition had 17 participants. Low MMSE SI, MCI and ECI groups had 12, 13, and 11 participants, respectively.

6.1.4 – Procedure

6.1.4.1 – Interviewer Training

The researcher conducted all interviews. The *Achieving Best Evidence* document (Home Office, 2001) and Köhnken's (1993) Structured Interview manual were used to prepare for SIs, while Fisher and Geiselman's (1992) manual was used to prepare for ECIs and MCIs. The researcher spent 4 hours practising the different interviewing techniques with another trained interviewer and conducted 12 practice interviews (4 of each type) with volunteers from a local residential home for older adults. After practice interviews were performed, they was evaluated and discussed with the trained interviewer.

6.1.4.2 – Participant Testing

As previously described (Study 2), participants were tested individually. Prior to showing the video, the study was explained, and participants were asked to read and sign a consent form (see Appendix I). After viewing the video, each participant spent 30 minutes in conversation with the researcher. Conversations revolved around the hobbies and interests of the participant and current world events.

Interviews were conducted in the same location that the video had been shown (refer to Section 4.1.4.2). To reduce memory-enhancing effects of physical context reinstatement (Tulving & Thomson, 1973; Smith, 1988), the environment was altered by repositioning participants to face the opposite wall and by opening the window blinds. Interviews were concluded when participants gave a negative response to the question "is there anything else you can remember about the video?" The MMSE (Folstein et al., 1975) was administered after a 2-5min break following the interview. Participants were then debriefed.

6.1.4.3 – Interview Coding

All interviews were audio-taped and transcribed (see Appendix J for an example of a transcribed interview). Transcripts were edited of information that could identify participants and scored by the researcher. As explained in Study 2, responses were coded and scored using a technique based on Memon et al. (1996, 1997a, b; Holliday, 2003a, b). The film stimulus was independently written up in template form by the researcher and an assistant who was unaware of the nature of the study. Each piece of information in the video was identified as a discrete unit and classified as an Action (A), Person (P), Object (O) or Surrounding (S) detail. The resulting templates were compared and a summary template, reflecting the agreement between the two individuals, was constructed. If any participant mentioned a detail that was not listed on the summary template the researcher confirmed this by viewing the video. Confirmed details were added to the summary template (see Appendix L for the final template). In total, this template contained 699 pieces of information: 121 action, 387 person, 81 object, and 110 surrounding details.

Interview transcripts were also re-written in template form, such that the templates consisted only of information that was relevant to the video. Responses that were subjective or vague were excluded from the interview template (cf. Geiselman et al., 1986; Memon et al. 1994, 1995).

Responses that expressed uncertainty were assigned to a separate category (*uncertain responses*; see Memon et al., 1994, 1995). If a participant repeated a detail during an interview it was only scored the first time mentioned. If a participant changed a response only the final response was considered (cf. McMahon, 2000). As in the summary template, each piece of relevant information mentioned during the course of an interview was classified as a Person, Action, Object or Surrounding detail (see Appendix M for an interview in template form).

Next, the details in each interview template were scored for accuracy. Items were correct if they matched the video and incorrect if they were discrepant from the video (e.g., pink car instead of blue car). Following Gudjonsson (1992) and McMahon (2000), details were scored as confabulations if they were not present in the film (e.g., "a policeman arrived to help the car owners"). Details were also classified as to whether they were reported in the free recall or questioning phase of interviews (cf. Memon et al., 1997a, b).

In Study 2, the measures of inter-rater reliability calculated for the total number of correct, incorrect and confabulated details reported were based on the interviews of young adults, young-old adults, old-old adults who scored above 26 on the MMSE and old-old adults who achieved scores of 0-26 on the MMSE. The resulting correlations of two raters' scores for these items were: $r_{correct} = .90$, $p < .001$; $r_{incorrect} = .82$, $p < .001$; and $r_{confabulated} = .89$, $p < .001$, respectively. Inter-rater reliability for the total number of correct, incorrect and confabulated *Uncertain responses* was found to be $r_{correct} = .92$, $p < .001$; $r_{incorrect} = .82$, $p < .001$; and $r_{confabulated} = .86$, $p < .001$, respectively. These values will serve as measures of inter-rater reliability for the present study.

6.2 – Results

6.2.1 – Interview Quality

An independent rater examined 18 interviews (three from each condition) for the presence or absence of the following seven features: uses supportive listening, uses appropriate vocabulary, asks questions that are witness compatible, does not interrupt the witness, does not ask multiple questions, does not ask leading or misleading questions, and does not re-ask a question (see Appendix N for definitions). For each interview, a summary measure (Technique Quality) was calculated to reflect the total number of features present in that interview (i.e., a Technique Quality score of 5 was assigned if 5 of the 7 features listed above were present). An ANOVA was performed to determine whether Technique Quality scores were influenced by interview type or MMSE score. No significant differences were found between the mean Technique Quality scores in SI ($M = 6.33$, $SD = .82$), MCI ($M = 6.17$, $SD = .98$), or ECI ($M = 6.17$, $SD = .75$) conditions, $F(2, 12) = .07$, $MSE =$

.83, p = .94. Similarly, there were no significant differences, F (1, 12) = 1.07, MSE = .83, p = .32, between the mean scores of those with low (M = 6.00, SD = .87) and high (M = 6.44, SD = .73) MMSEs. Recall was not an artefact of Technique Quality therefore this variable was excluded from analyses.

The rater scored the same set of interviews using a rating of 1 (not at all present) to 7 (very good) for the following measures: Interviewer Polite, Interviewer Friendly, Interview Not Rushed and Overall Rapport Between Interviewer and Interviewee (see Appendix N). For each interview, a measure of Social Quality was calculated by averaging the scores of the Polite, Friendly, Not Rushed and Overall Rapport measures. An ANOVA was then performed to determine whether Social Quality scores were influenced by interview type or age. No significant differences were found between the mean Social Quality scores in SI (M = 6.04, SD = .56), MCI (M = 5.92, SD = .72), or ECI (M = 6.08, SD = .82) conditions, F (2, 12) = .10, MSE = .47, p = .91. Similarly, no effect of MMSE score was observed, F (1, 12) = 3.92, MSE = .47, p = .07. Social Quality was therefore excluded from further analyses. In addition, the rater was asked to ensure that each ECI, MCI and SI contained the appropriate instructions and questions (see Appendix H). All interviews met the required criteria.

6.2.2 – Gender, Interview Duration and the Number of Questions Asked

No significant gender differences in the total number of correct, incorrect or confabulated details elicited over the course of the entire interview were found. Similarly, there were no significant gender differences in the completeness or accuracy of recall (all F's < 2.80, all p's > .10)[3]. The results presented here are, therefore, collapsed across gender.

To ensure that the quality and quantity of information recalled in each condition were not influenced by systematic differences in the length of interviews, or in the number of questions asked in interviews, interview duration and the number of questions asked were determined. Two separate univariate ANOVAs examined the effects of interview type and MMSE score on interview duration and the number of questions asked.

[3] The non-significant results obtained in the present study are summarized in Appendix Z.

Interview Duration. No significant main effects for interview type, F (2, 81) = 2.07, MSE = 32.96, p = .13, or MMSE score, F (1, 81) = 2.22, MSE = 32.96, p = .14, were observed.

Number of Questions. No main effects were found for either interview type, F (2, 81) = .04, MSE = 64.33, p = .97, or MMSE score, F (1, 81) = 1.44, MSE = 64.33, p = .23. Consequently, interview duration and the number of questions asked were not used as covariates in subsequent analyses.

6.2.3 – Adjustment of Analyses when Conditions Contain Unequal N's

If cells in a factorial design contain unequal numbers of scores, main and interaction effects will not be independent of one another (Howell, 1997). All main and interaction effects will therefore account for overlapping portions of the overall variation, making it difficult to determine which effect is responsible for the variance observed. Having unequal *N*'s in each condition also creates ambiguity about whether the observed marginal means represent the mean of the *scores* in each cell, or the mean of the *mean scores* of each cell (Tabachnick & Fidell, 1996). Tabachnick and Fidell (1996) described four different ways of adjusting for the presence of unequal N's in each condition: 1) Random deletion of cases to equalize cell sizes, 2) Giving each cell mean equal weight regardless of its sample size. This method treats sample size as independent of treatment conditions and assesses each main and interaction effect after adjusting for all the other main and interaction effects. Each effect is only assigned the proportion of variance that it uniquely explains. 3) Assigning more weight to the means of cells with larger sample sizes. In this method, main effects are adjusted for each other and interactions are adjusted for main effects. 4) Weighting cell means according to their theoretical importance, rather than according to their sample size. In this method, the researcher defines the sequence of adjustments for main and interaction effects.

The second method was selected for the present analyses because it is the most conservative and is used as the default in SPSS (Howell, 1997; Tabachnick & Fidell, 1996). Because SPSS bases calculations for unequal sample sizes on estimated marginal means (i.e., unweighted means) rather than on the true means (i.e., descriptive statistics), it is necessary to use the estimated marginal means and associated standard error values when conducting post-hoc tests (Tabachnick & Fidell, 1996). In the present study, the critical differences obtained with Tukey's

HSD tests were compared against the estimated marginal means, rather than against the true means (true means and standard deviations are reported in Appendix Y). In addition, the formula for determining the critical difference with Tukey's HSD was altered such that the harmonic mean[2] was used in place of N (cf. Howell, 1997).

6.2.4 – Recall Across Interview Phases

The mean numbers of correct, incorrect and confabulated details reported across both interview phases are shown in Table 6.1. A series of 2 (MMSE) x 3 (interview) univariate ANOVAs were performed on the number of correct, incorrect and confabulated Action, Person, Object, and Surrounding details reported, as well as on the total number of correct, incorrect and confabulated details elicited in the entire interview. Tukey's HSD post-hoc tests were conducted on significant interactions.

[2] The harmonic mean is determined using the formula: $N_h = p\ (1/N_1 + 1/N_2 + \ldots + 1/N_p)$, where p is the number of cells in the ANOVA design.

Table 6.1
Mean number of correct, incorrect and confabulated details recalled across interview phases, as a function of MMSE score and interview (standard errors in brackets)

	MMSE Score		Interview		
	Low	High	SI	MCI	ECI
Correct					
Action	18.65 (1.61)	24.96 (1.35)	17.23 (1.82)	25.12 (1.78)	23.08 (1.87)
Person	33.93 (3.21)	54.77 (2.69)	35.86 (3.62)	48.63 (3.53)	48.55 (3.71)
Object	12.95 (1.22)	14.35 (1.02)	10.77 (1.38)	14.75 (1.35)	15.43 (1.41)
Surround	9.16 (1.42)	13.43 (1.19)	7.86 (1.60)	11.79 (1.56)	14.23 (1.64)
Total	74.72 (6.30)	107.65 (5.28)	71.71 (7.11)	100.50 (6.95)	101.34 (7.30)
Incorrect					
Action	1.77 (0.25)	0.88 (0.21)	0.95 (0.28)	1.88 (0.27)	1.16 (0.29)
Person	8.43 (0.90)	10.04 (0.83)	9.54 (1.12)	10.15 (1.09)	8.02 (1.15)
Object	1.75 (0.29)	1.78 (0.24)	1.56 (0.33)	1.84 (0.32)	1.90 (0.34)
Surround	1.08 (0.20)	1.49 (0.17)	1.08 (0.22)	1.33 (0.22)	1.44 (0.23)
Total	13.03 (1.26)	14.22 (1.05)	13.13 (1.42)	15.23 (1.39)	12.51 (1.46)
Confabulated					
Action	0.52 (0.14)	0.20 (0.12)	0.65 (0.16)	0.28 (0.15)	0.15 (0.16)
Person	1.62 (0.40)	1.24 (0.33)	1.26 (0.45)	1.41 (0.44)	1.61 (0.46)
Object	0.37 (0.18)	0.39 (0.15)	0.79 (0.20)	0.12 (0.20)	0.24 (0.21)
Surround	0.14 (0.07)	0.16 (0.06)	0.17 (0.08)	0.10 (0.07)	0.18 (0.08)
Total	2.65 (0.56)	1.98 (0.45)	2.87 (0.63)	1.91 (0.62)	2.18 (0.65)

Correct details.

MMSE effects: For the total number of correct details recalled across the entire interview, a main effect of MMSE score was found, F (1, 81) = 16.03, MSE = 1423.79, η_p^2 = .12, p < .001. Individuals who scored low on the MMSE reported fewer correct details (M = 74.72) than those with high MMSE scores (M = 107.65). In addition, a main effect of MMSE score was observed for the number of correct Action, F (1, 81) = 8.99, MSE = 93.08, η_p^2 = .10, p < .01, Person, F (1, 81) = 24.83, MSE = 368.01, η_p^2 = .24, p < .001, and Surrounding, F (1, 81) = 5.34, MSE = 71.89, η_p^2 = .06, p < .05, details. Participants who scored low on the MMSE recalled fewer correct Action, Person and Surrounding details (M_{action} = 18.65, M_{person} = 33.93, $M_{\text{surrounding}}$ = 9.16) than those with high MMSE scores (M_{action} = 24.96, M_{person} = 54.77, $M_{\text{surrounding}}$ = 13.43). However, no effect of MMSE score was observed for the number of correct Object details recalled, F (1, 81) = .78, MSE = 53.41, p = .38.

Interview Effects: A main effect of interview was found, F (2, 81) = 5.61, MSE = 1423.79, η_p^2 = .12, p < .01, with those in the ECI (M = 101.34) and MCI (M = 100.50) conditions recalling more correct information than individuals in the SI condition (M = 71.71). Main effects of interview type were also found for the number of correct Action, F (2, 81) = 5.14, MSE = 93.08, η_p^2 = .13, p < .01, Person, F (2, 81) = 4.13, MSE = 368.01, η_p^2 = .09, p < .05, Object, F (2,81) = 3.32, MSE = 53.41, η_p^2 = .08, p < .05, and Surrounding, F (2, 81) = 3.96, MSE = 71.89, η_p^2 = .09, p < .05, details reported. Participants in the SI condition recalled fewer Action, Person, and Object details (M_{action} = 17.23, M_{person} = 35.86, M_{object} = 10.77) than those in the MCI (M_{action} = 25.12, M_{person} = 48.63, M_{object} = 14.75) or ECI (M_{action} = 23.08, M_{person} = 48.55, M_{object} = 15.43) conditions. Participants given an SI also recalled fewer correct Surrounding (M = 7.86) details than those given an ECI (M = 14.23).

An interaction effect was found for the number of correct Surrounding details reported, F (2, 81) = 5.25, MSE = 71.89, η_p^2 = .11, p < .01. Those with low MMSE scores recalled fewer correct Surrounding details than those with high MMSE scores (M_{low} = 7.82, M_{high} = 20.65) in the ECI condition, although no such differences were found in the MCI (M_{low} = 12.00, M_{high} = 11.59) or SI (M_{low} = 7.67, M_{high} = 8.06) conditions. For participants with high MMSE scores, the ECI elicited more correct Surrounding details than the MCI, which elicited more Surrounding details than the SI (M_{SI} = 8.06,, M_{MCI} = 11.59, M_{ECI} = 20.65). Conversely, there were no such differences for participants with low MMSE scores (M_{ECI} = 7.82, M_{MCI} = 12.00, M_{SI} = 7.67). No other interaction effects were observed (all *F*'s < 1.96, all *p*'s > .15).

Incorrect details.

MMSE Effects: A main effect of MMSE score was found for the number of incorrect Action details reported, F (1, 81) = 7.66, MSE = 2.18, η_p^2 = .09, p < .01. People with low scores gave more incorrect responses (M = 1.77) than those with high scores (M = .88). No other MMSE effects were found (*F*'s < 2.57, *p*'s > .11).

Interview Effects: A marginally significant main effect of interview type was found for the number of incorrect Action details reported, F (2, 81) = 3.11, MSE = 2.18, η_p^2 = .07, p = .05. The MCI elicited more incorrect information (M = 1.88) than the ECI (M = 1.16) or SI (M = .95). No other interview effects were found (all *F*'s < 1.41, all *p*'s > .37).

No interaction effects were observed (all *F*'s < 2.08, all *p*'s > .13).

Confabulated details.

MMSE Effects: No significant effects of MMSE were observed (all *F*'s < 3.33 all *p*'s > .07).

Interview Effects: A marginally significant main effect of interview was found for the number of confabulated Object details reported, F (2, 81) = 3.10, MSE = 1.16, η_p^2 = .04, p = .05. The SI elicited more confabulated Object details (M = .79) than either the MCI (M = .12) or ECI (M = .24). No other effects of interview were observed (all *F*'s < 2.74, all *p*'s > .07). No interaction effects were observed (all *F*'s < 1.17, all *p*'s > .32).

6.2.5 –Free Recall Phase

The mean numbers of correct, incorrect and confabulated details reported by participants in the free recall phase are illustrated in Table 6.2. Several 2 (MMSE) x 3 (interview) univariate ANOVAs were performed on the number of correct, incorrect and confabulated Action, Person, Object, and Surrounding details reported, as well as on the free recall phase. Significant interactions were examined with Tukey's HSD tests.

Table 6.2
*Mean number of correct, incorrect and confabulated details recalled in the **free recall phase**, as a function of MMSE score and interview (standard errors shown in brackets)*

	MMSE Score		Interview		
	Low	High	SI	MCI	ECI
Correct					
Action	12.55 (1.07)	17.71 (0.90)	10.62 (1.21)	17.23 (1.78)	17.54 (1.24)
Person	13.67 (1.73)	25.51 (1.45)	13.04 (1.95)	22.16 (1.90)	23.58 (2.00)
Object	6.51 (0.76)	8.82 (0.64)	4.80 (0.86)	8.81 (0.84)	9.39 (0.88)
Surround	3.22 (0.90)	4.77 (0.75)	1.67 (1.02)	4.27 (0.99)	6.03 (1.04)
Total	35.95 (3.72)	56.94 (3.12)	30.13 (4.20)	52.68 (4.10)	56.53 (4.31)
Incorrect					
Action	0.95 (0.17)	0.53 (0.14)	0.27 (0.19)	1.17 (0.19)	0.78 (0.20)
Person	1.37 (0.27)	1.86 (0.23)	0.99 (0.31)	2.25 (0.30)	1.62 (0.32)
Object	0.34 (0.09)	0.22 (0.07)	0.18 (0.10)	0.33 (0.10)	0.32 (0.10)
Surround	0.17 (0.11)	0.47 (0.09)	0.06 (0.12)	0.35 (0.12)	0.55 (0.12)
Total	2.83 (0.43)	3.08 (0.36)	1.50 (0.48)	4.10 (0.47)	3.26 (0.50)
Confabulated					
Action	0.24 (0.10)	0.16 (0.09)	0.37 (0.12)	0.20 (0.11)	0.08 (0.12)
Person	0.49 (0.16)	0.47 (0.14)	0.48 (0.18)	0.54 (0.18)	0.41 (0.19)
Object	0.17 (0.07)	0.14 (0.06)	0.26 (0.08)	0.09 (0.08)	0.12 (0.08)
Surround	0.02 (0.03)	0.08 (0.03)	0.01 (0.04)	0.03 (0.04)	0.09 (0.04)
Total	0.93 (0.29)	0.84 (0.24)	1.10 (0.33)	0.86 (0.32)	0.70 (0.34)

Correct details.

MMSE Effects: For the total number of correct details reported in the free recall phase, a main effect of MMSE score was observed, F (1, 81) = 18.73, MSE = 495.33, $\eta_p^2 = .19, p < .001$. Low MMSE scorers reported fewer correct details (M = 35.95) than those with high scores (M = 56.94). Main effects of MMSE score were also found for the number of correct Action, F (1, 81) = 13.72, MSE = 40.85, η_p^2 = .12, $p < .001$, Person, F (1, 81) = 27.63, MSE = 106.75, η_p^2 = .25, $p < .001$, and Object, F (1, 81) = 5.40, MSE = 20.81, η_p^2 = .06, $p < .05$, details recalled. In each case, individuals with low scores recalled fewer correct details (M_{action} = 12.55, M_{person} = 13.67, M_{object} = 6.51) than those with high scores (M_{action} = 17.71, M_{person} = 25.51, M_{object} = 8.82). No effect of MMSE score was found for the number of correct Surrounding details elicited, F (1, 81) = 1.74, MSE = 29.02, p = .19.

Interview Effects: For the total number of correct details reported in the free recall phase, a main effect of interview was observed, F (2, 81) = 11.46, MSE = 495.33, η_p^2 = .22, $p < .001$. Those in the ECI (M = 56.53) and MCI (M = 52.68) conditions recalled more correct information than individuals in the SI condition (M = 30.13). A main effect of interview was also found for the number of correct Action, F (2, 81) = 10.50, MSE = 40.85, η_p^2 = .21, $p < .001$, Person, F (2, 81) = 8.55, MSE = 106.75, η_p^2 = .17, $p < .001$, Object, F (2, 81) = 8.39, MSE = 20.81, η_p^2 = .17, $p < .001$, and Surrounding, F (2, 81) = 4.56, MSE = 29.02, η_p^2 = .10, $p < .05$, details reported. In the case of Action, Person and Object details, ECIs (M_{action} = 17.54, M_{person} = 23.58, M_{object} = 9.39) and MCIs (M_{action} = 17.23, M_{person} = 22.16, M_{object} = 8.81) elicited more correct information than SIs (M_{action} = 10.62, M_{person} = 13.04, M_{object} = 4.80), whereas only ECIs (M = 6.03) resulted in more correct Surrounding details than SIs (M = 1.67).

An interaction effect between interview type and MMSE score was observed for the number of correct Surrounding details recalled, F (2, 81) = 4.34, MSE = 29.02, η_p^2 = .10, $p < .05$. Low scorers recalled fewer correct Surrounding details than those with high scores in the ECI condition (M_{low} = 2.82, M_{high} = 9.24), although no such differences were found in the MCI (M_{low} = 5.08, M_{high} = 3.47), or SI (M_{low} = 1.75, M_{high} = 1.59) conditions. For participants with high MMSE scores, the ECI elicited more correct Surrounding details than the MCI, which elicited more correct Surrounding details than the SI (M_{ECI} = 1.59, M_{MCI} = 3.47, M_{SI} = 9.24). Conversely, there were no such differences for participants with low MMSE scores ($M_{ECI} = 2.82$, $M_{MCI} = 5.08$, $M_{SI} = 1.75$). No other interaction effects were observed (all F's < 2.58, all p's > .09).

Incorrect details.

MMSE Effects: A main effect of MMSE score was found for the number of incorrect Surrounding details reported, $F(1, 81) = 4.74$, $MSE = .41$, $\eta_p^2 = .06$, $p < .05$. Individuals who scored low on the MMSE reported fewer incorrect Surrounding details ($M = .17$) than those who scored high on this test ($M = .47$). A marginally significant main effect was also found for the number of incorrect Action details reported, $F(1, 81) = 3.55$, $MSE = 1.05$, $\eta_p^2 = .04$, $p = .06$. Low scorers reported more incorrect Action details ($M = .95$) than those with high scores ($M = .53$). No other MMSE effects were found (all F's < 1.91, all p's > .29).

Interview Effects: For the total number of incorrect details, a main effect was found for interview, $F(2, 81) = 7.66$, $MSE = 6.57$, $\eta_p^2 = .16$, $p < .01$. The ECI ($M = 3.26$) and MCI ($M = 4.10$) elicited more incorrect information than the SI ($M = 1.50$). A main effect of interview was also found for the number of incorrect Action, $F(2, 81) = 5.53$, $MSE = 1.05$, $\eta_p^2 = .12$, $p < .01$, Person, $F(2, 81) = 4.33$, $MSE = 2.66$, $\eta_p^2 = .10$, $p < .05$, and Surrounding, $F(2, 81) = 4.10$, $MSE = .41$, $\eta_p^2 = .002$, $p < .05$, details reported. The SI elicited fewer incorrect Action and Person details ($M_{action} = .27$, $M_{person} = .99$) than the MCI ($M_{action} = 1.17$, $M_{person} = 2.25$). The SI also resulted in fewer incorrect Surrounding details ($M = .06$) than the MCI ($M = .35$), which resulted in fewer incorrect Surrounding details than the ECI ($M = .55$). No effect of interview was found for the number of incorrect Object details recalled, $F(2, 81) = .68$, $MSE = .27$, $p = .51$.

A marginally significant Interview x MMSE interaction was observed for the number of incorrect Person details recalled, $F(2, 81) = 3.08$, $MSE = 2.65$, $\eta_p^2 = .07$, $p = .05$. High MMSE scorers recalled more incorrect Person details than low MMSE scorers in the ECI condition ($M_{low} = 1.00$, $M_{high} = 2.24$), although no such differences were found in the MCI ($M_{low} = 2.62$, $M_{high} = 1.88$), or SI ($M_{low} = .50$, $M_{high} = 1.47$) conditions. For participants with low MMSE scores, the MCI elicited more incorrect Person details than either the ECI or the SI ($M_{ECI} = 1.00$, $M_{MCI} = 2.62$, $M_{SI} = .50$). There were no such differences for participants with high MMSE scores ($M_{ECI} =$

2.24, $M_{MCI} = 1.88$, $M_{SI} = 1.47$). No other interaction effects were observed (all F's < 2.51, all p's > .09).

Confabulated details.

No main effects of MMSE score or interview type were found (all F's < 1.56, all p's > .09). Similarly, no MMSE score by interview interaction effects were observed (all F's < 1.39, all p's > .26).

6.2.6 –Questioning Phase

The mean numbers of correct, incorrect and confabulated details reported in the questioning phase are shown in Table 6.3. A series of 2 (MMSE) x 3 (interview) univariate ANOVAs were performed on the number of correct, incorrect and confabulated Action, Person, Object and Surrounding details reported, as well as on the total number of correct, incorrect and confabulated details elicited in the questioning phase. Tukey's HSD tests were used to examine significant interactions.

Correct details.

MMSE Effects: Main effects of MMSE score were found for the number of correct Person, $F(1, 81) = 11.76$, $MSE = 148.52$, $\eta_p^2 = .13$, $p < .01$, and Surrounding details, $F(1, 81) = 5.84$, $MSE = 27.06$, $\eta_p^2 = .07$, $p < .05$, as well as for the total number of correct details, $F(1, 81) = 6.84$, $MSE = 449.64$, $\eta_p^2 = .08$, $p < .05$, recalled in the questioning phase. Low MMSE scorers reported fewer correct Person and Surrounding details ($M_{person} = 20.16$, $M_{surrounding} = 5.95$), and fewer correct details in total ($M_{total} = 38.65$), than those with high scores ($M_{person} = 29.28$, $M_{surrounding} = 8.96$, $M_{total} = 50.75$). MMSE effects were not observed for the number of correct Action, or Object details reported (all F's < 1.07; all p's > .30).

No main effects of interview (all F's < 1.50, all p's > .23) and no interaction effects (all F's < .98, all p's > .38) were observed.

Table 6.3

Mean number of correct, incorrect and confabulated details recalled in ***questioning phase****, as a function of MMSE score and interview (standard errors shown in brackets)*

	MMSE Score		Interview		
	Low	High	SI	MCI	ECI
Correct					
Action	6.11 (0.85)	7.26 (0.71)	6.61 (0.96)	7.89 (0.94)	5.54 (0.99)
Person	20.16 (2.04)	29.28 (1.71)	22.82 (2.30)	26.47 (2.25)	24.87 (2.36)
Object	6.44 (0.70)	5.53 (0.59)	5.97 (0.79)	5.94 (0.78)	6.04 (0.82)
Surround	5.95 (0.87)	8.69 (0.73)	6.19 (0.98)	7.52 (0.96)	8.24 (1.01)
Total	38.65 (3.54)	50.75 (2.97)	41.59 (3.99)	47.82 (3.91)	44.69 (4.10)
Incorrect					
Action	0.80 (0.15)	0.35 (0.12)	0.68 (0.16)	0.67 (0.16)	0.38 (0.17)
Person	7.06 (0.92)	8.24 (0.77)	8.55 (1.04)	7.90 (1.01)	6.49 (1.06)
Object	1.41 (0.24)	1.53 (0.20)	1.38 (0.27)	1.51 (0.26)	1.52 (0.28)
Surround	0.91 (0.18)	1.01 (0.15)	1.02 (0.20)	1.01 (0.20)	0.83 (0.21)
Total	10.18 (1.10)	11.12 (0.92)	11.63 (1.24)	11.09 (1.21)	9.22 (1.27)
Confabulated					
Action	0.25 (0.08)	0.04 (0.07)	0.28 (0.09)	0.08 (0.09)	0.08 (0.10)
Person	1.13 (0.30)	0.77 (0.25)	0.78 (0.33)	0.87 (0.33)	1.19 (0.34)
Object	0.20 (0.15)	0.26 (0.13)	0.53 (0.17)	0.03 (0.16)	0.12 (0.17)
Surround	0.14 (0.06)	0.08 (0.05)	0.17 (0.07)	0.07 (0.06)	0.09 (0.07)
Total	1.72 (0.38)	1.14 (0.32)	1.77 (0.43)	1.04 (0.42)	1.48 (0.44)

Incorrect details.

MMSE Effects: A main effect of MMSE score was found for the number of incorrect Action details reported, F (1, 81) = 5.50, MSE = .76, η_p^2 = .06, p < .05, such that low MMSE scorers reported more incorrect Action details (M = .80) than high scorers (M = .35). No other MMSE effects were observed (F's < .96, p's > .33).

Interview Effects: No effects of interview were found (F's < 1.07, p's > .35).

An interaction effect between interview and MMSE score was observed for the number of incorrect Object details reported, F (2, 81) = 3.53, MSE = 2.04, η_p^2 = .08, p < .05. Individuals with high MMSE scores reported more incorrect Object details than those with low scores when given a SI (M_{low} = .75, M_{high} = 2.00), although there were no such differences in the MCI (M_{low} = 1.85, M_{high} = 1.18) and ECI (M_{low} = 1.64, M_{high} = 1.41) conditions. No other interaction effects were observed (all F's < 1.21, all p's > .30).

Confabulated details.

MMSE Effects: A marginally significant main effect of MMSE score was found for the number of confabulated Action details reported in the questioning phase, F (1, 81) = 3.82, MSE = .24, η_p^2 = .05, p = .05. Those who scored low on the MMSE reported more confabulated Action details (M = .80) than those who scored high on the MMSE (M = .35). No other effects of MMSE score were observed (all F's < 1.39, all p's > .24).

No main effects of interview (all F's < 2.56, all p's > .09) or interaction effects (all F's < 1.27, all p's > .29) were found.

6.2.7 – Uncertain Responses

The mean numbers of correct, incorrect and confabulated uncertain response details reported are illustrated in Table 6.4. A series of 2 (MMSE) x 3 (interview) univariate ANOVAs were performed to examine the total amount of correct information reported across and within interview phases. Similarly, 2 (MMSE) x 3 (interview) univariate ANOVAs were used to examine recall of Action, Person, Object and Surrounding details. Significant interactions were investigated with Tukey's HSD tests.

Table 6.4

Mean number of correct, incorrect and confabulated uncertain response details recalled in the free recall (FR) phase, questioning (Q) phase and entire interview as a function of MMSE score and interview (standard errors shown in brackets)

	MMSE Score		Interview		
	Low	High	SI	MCI	ECI
Correct					
FR Phase	0.08 (0.06)	0.10 (0.05)	0.02 (0.07)	0.08 (0.07)	0.16 (0.07)
Q Phase	0.30 (0.16)	0.59 (0.14)	0.29 (0.19)	0.45 (0.18)	0.59 (0.19)
Entire	0.38 (0.18)	0.69 (0.15)	0.32 (0.20)	0.52 (0.19)	0.76 (0.20)
Incorrect					
FR Phase	0.05 (0.04)	0.04 (0.04)	0.03 (0.05)	0.11 (0.05)	0.00 (0.05)
Q Phase	0.30 (0.17)	0.61 (0.14)	0.37 (0.19)	0.59 (0.18)	0.40 (0.19)
Entire	0.32 (0.17)	0.65 (0.14)	0.35 (0.19)	0.70 (0.19)	0.40 (0.20)
Confabulated					
FR Phase	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Q Phase	0.23 (0.07)	0.04 (0.06)	0.08 (0.08)	0.08 (0.08)	0.24 (0.09)
Entire	0.23 (0.07)	0.04 (0.06)	0.08 (0.08)	0.08 (0.08)	0.24 (0.09)

In the free recall phase, no significant differences were found in the number of uncertain correct, incorrect or confabulated details recalled as a function of interview type or MMSE score. Similarly, no interaction effects were observed (all F's < 1.28, all p's > .28).

In the questioning phase, a marginally significant main effect of MMSE score was found for the number of confabulated details reported, F (1, 81) = 3.88, MSE = .02, η_p^2 = .05, p = .05. The uncertain responses made by participants with low MMSE scores contained more confabulated details (M = .23) than the uncertain responses made by those with high scores (M = .04). No other main or interaction effects were observed in this phase (all F's < 2.04, all p's > .16). Across the entire interview, no main or interaction effects were observed (all F's < 2.96, all p's > .08). The total number of uncertain responses made by low MMSE participants (M = .90, SE = .27) was also not significantly different from the total number of uncertain responses made by those with high scores (M = 1.37, SE = .22), F (1, 81) = 1.84, MSE = 2.51, p = .18.

6.2.8 - Accuracy of Recall

As in Studies 2 and 3, the recall accuracy of each participant was determined by dividing the number of *correct* details she or he reported by the *total* number of details she or he reported. Mean accuracy scores for each interview phase and condition are shown in Table 6.5. Three separate 2 (MMSE score) x 3 (interview) univariate ANOVAs were conducted to determine whether recall accuracy was influenced by MMSE score or interview type and significant interactions were indentified using Tukey's HSD tests.

When accuracy of recall across interview phases was examined, main effects were found for both interview type, F (2, 81) = 4.86, MSE = .005, η_p^2 = .11, p < .05, and MMSE score, F (1, 81) = 10.04, MSE = .005, η_p^2 = .11, p < .01. ECIs (M = .86) and MCIs (M = .85) resulted in more accurate information than SIs (M = .81), and those with high MMSE scores were more accurate (M = .86) than those low MMSE scores (M = .82).

In the free recall phase, no main effects of interview, F (2, 81) = .46, MSE = .005, p = .63, or MMSE score, F (1, 81) = 2.61, MSE = .005, p = .11, were observed.

Finally, main effects for both interview, F (2, 81) = 3.26, MSE = .01, η_p^2 = 0.07, p < .05, and MMSE score, F (1, 81) = 7.84, MSE = .01, η_p^2 = .09, p < .01, were observed in the questioning phase. The accuracy of MCI recall (M = .80) was greater than either ECI (M = .79) or SI recall (M = .74). Furthermore, those with high MMSE scores were more accurate (M = .81) than those with low scores (M = .75). No interaction effects were observed in any interview phase (all F's < .47, all p's > .62).

Table 6.5

Mean accuracy scores in the free recall (FR) phase, questioning (Q) phase and entire interview, as a function of MMSE score and interview (standard errors in brackets)

	MMSE Score		Interview		
	Low	High	SI	MCI	ECI
FR Phase	0.91 (0.01)	0.93 (0.01)	0.92 (0.01)	0.91 (0.01)	0.93 (0.01)
Q Phase	0.75 (0.02)	0.81 (0.01)	0.74 (0.02)	0.80 (0.02)	0.79 (0.02)
Entire Interview	0.82 (0.01)	0.86 (0.01)	0.81 (0.01)	0.85 (0.01)	0.86 (0.01)

6.2.9 - Completeness of Recall

Completeness of recall scores were obtained by dividing the total number of correct details each participant reported by the total number of possible correct details (i.e., 699 details, see Appendix L). Mean completeness scores for each interview phase and condition are shown in Table 6.7. To examine whether completeness of recall across interview phases, and in the free recall and questioning phases varied according to interview type or MMSE score, three separate 2 (MMSE score) x 3 (interview) univariate ANOVAs were conducted. Significant interactions were examined with Tukey's HSD tests.

Across interview phases, main effects of interview type, F (2, 81) = 5.61, MSE = .003, η_p^2 = .12, p < .01, and MMSE score, F (1, 81) = 16.03, MSE = .003, η_p^2 = .17, p < .001, were found. ECIs (M = .15) and MCIs (M = .14) resulted in more complete accounts than SIs (M = .10). High MMSE scorers gave more complete accounts (M = .15) than low scorers (M = .11).

In the free recall phase, main effects of interview, F (2, 81) = 11.46, MSE = .001 η_p^2 = .22, p < .001, and MMSE score, F (1, 81) = 18.73, MSE = .001, η_p^2 = .19, p < .01, were observed. Again, individuals in ECI (M = .08) and MCI (M = .08) conditions gave accounts that were more complete than those in the SI condition (M = .04), and high MMSE scorers (M = .04) gave accounts that were more complete than low scorers (M = .05).

In the questioning phase, a main effect of MMSE score was observed, F (1, 81) = 6.84, MSE = .001, η_p^2 = .08, p < .05. High-MMSE individuals had more complete recall (M = .07) than low-MMSE individuals (M = .06). However, no effect of interview type was found in the questioning phase, F (2, 81) = .62, MSE = .001, p < .54. No Interview x MMSE score interactions were observed across the entire interview or in either interview phase (all F's < 2.40, all p's > .10).

Table 6.7

Mean completeness of recall in the free recall (FR) phase, questioning (Q) phase and entire interview, as a function of MMSE score and interview (Standard Errors in brackets)

	MMSE Score		Interview		
	Low	High	SI	MCI	ECI
FR Phase	0.05 (0.01)	0.08 (0.00)	0.04 (0.01)	0.08 (0.01)	0.08 (0.01)
Q Phase	0.06 (0.01)	0.07 (0.00)	0.06 (0.01)	0.07 (0.01)	0.06 (0.01)
Entire Interview	0.11 (0.01)	0.15 (0.01)	0.10 (0.01)	0.14 (0.01)	0.15 (0.01)

6.3 – Discussion

The major aim of this study was to examine the quality and quantity of recall obtained from old-old adults as a function of cognitive ability, as measured by the MMSE, (Folstein et al., 1975) and interview type. Specifically, the study compared the recall of participants with high and low MMSE scores and determined whether the ECI and MCI were useful with cognitively impaired older adults. The following discussion will examine observations that relate to cognitive ability and interview type, in turn.

6.3.1 – *Comparing the Recall of Participants who scored low and high on the MMSE*

As predicted, and consistent with previous studies that have examined the recall performance of cognitively impaired adults (e.g., Brown & Geiselman, 1990; Milne et al., 1999), it was found that participants with high MMSE scores recalled 31% more correct information across interview phases than those with low MMSE scores. Specifically, participants with high MMSE scores recalled more correct Action, Person, and Object details in the free recall phase, and more correct Person and Surrounding details in the questioning phase. The largest differences between each group's recall of correct details arose from the number of Action and Person details reported. This may be because impaired cognitive functioning is associated with less elaborate or complete mental scripts in which to fit observed actions and events (Milne et al., 1999), and because Person details are particularly difficult for them to process. Indeed, recalling Person details is a task that even non-impaired individuals find challenging (Memon & Vartoukian, 1996).

Impaired and non-impaired participants did not differ in terms of the number of incorrect details they recalled (cf. Brown & Geiselman, 1990; Milne et al., 1999). Similarly, no overall differences were observed in the number of confabulated details reported by participants from each MMSE group. This result supports a study conducted by Gudjonsson and Clare (1995) in which learning disabled adults and adults from the general population (aged 17-69-years) were asked to recall a verbally presented narrative. Gudjonsson and Clare (1995) demonstrated that the number of reported confabulations did not correlate with intellectual ability. In contrast, Milne et al. (1999) reported that cognitively impaired young adults recalled more confabulated details (especially of the Person type) than non-impaired participants. However, Milne et al. (1999) suggested that this observation could have reflected the use of poor questioning techniques by one interviewer (i.e., suggestive, forced-choice questions) and individual differences among participants (e.g., differences in personality; Gudjonsson & Clare, 1995; Gudjonsson & Sigurdsson, 1996).

When specific detail types were considered, the present study found that individuals with low MMSE scores reported more incorrect Action details than those with high scores. As mentioned above, this difference may be linked to schema disruptions among impaired individuals. According to Schwartz and Buxbaum (1997), action schema degradation (e.g., among individuals with frontal lobe damage) is caused by impairments to the Supervisory Attentional System[1] and by an inability to access the knowledge stored in action schemas. Conversely, Sirigu et al. (1995) proposed that action schema degradation is the result of difficulties in linking action information together in a meaningful way (see Humphreys & Forde, 1998, for review).

It was also found that the recall of old-old adults with low MMSE scores was less accurate (82%) than the recall of those with high scores (86%). Other studies to examine the accuracy rates of impaired individuals have obtained similar results. For example, Milne et al. (1999) reported accuracy rates of 77% and 85% for impaired and non-impaired adults, respectively, whereas Milne & Bull (1996) reported that children with learning disabilities achieved an accuracy rate of 77%. Although cognitively impaired old-old adults are slightly less accurate than controls this does not mean that they are unreliable witnesses. As Milne et al. (1999) argued, participants with cognitive impairments tend to achieve accuracy ratios that are similar to, and sometimes better than, those of children. Akehurst et al. (2003), for example, found that children aged 8-9-years and 11-12-years had accuracy rates of 63% and 80%, respectively. Because children are now generally regarded to be reliable witnesses, it seems reasonable that individuals with cognitive impairments should also be considered reliable.

Interestingly, the difference between the accuracy rates of high and low MMSE participants stemmed primarily from the questioning phase of interviews. This observation supports the results of a study by Perlman, Ericson, Esses, and Isaacs (1994), in which cognitively impaired and non-impaired young adults (17-26-

[1] According to Norman and Shallice's (1986) model of the control of action, the Supervisory Attentional System is involved in controlling of non-routine, 'intentional' actions that require 'higher-order' cognitive control. The Contention Scheduling System, on the other hand, explains how schemas are stored and activated for routine tasks.

years) watched a video and were asked to recall it using several different types of questions (free-recall, general, short-answer, specific and statement questions). The accuracy of each group was similar when free-recall was elicited, however, impaired participants were less accurate when responding to short-answer questions.

In addition to being less accurate, the recall of low MMSE scorers was also less complete than that of controls in both interview phases. Again, however, completeness of impaired older adults' testimonies (11% across the entire interview in the present study) is comparable to that of children. For example, Holliday (2003a) found that children aged 9-10-years and 4-5-years achieved completeness scores of 21% and 9%, respectively. The results of the present study therefore suggest that although the recall of impaired older adults is less accurate and less complete than that of controls, it is at least as reliable and complete as the recall of children and should not be discounted.

6.3.2 – Do the ECI and MCI enhance the recall of cognitively impaired older adults?

A second aim of this study was to examine whether the ECI and MCI enhanced the recall of older adults who display signs of cognitive impairment. When given an ECI or MCI, participants with low and high MMSE scores both recalled more correct information than individuals interviewed with the SI. Specifically, the low-MMSE group recalled 26% more correct information with the ECI and 41% more correct information with the MCI. These findings are similar to Brown and Geiselman (1990) and Milne et al.'s (1999) observations that the ECI increased the correct recall of cognitively impaired adults by 32% and 35%, respectively. They also suggest that the MCI could be more effective for cognitively impaired older witnesses than the ECI (see Section 6.3.3 for further discussion of this topic).

For both MMSE groups, the beneficial effects of the ECI and MCI arose from the free recall, rather than the questioning, phase of interviews. The observation that the ECI and MCI improved the free recall performance of cognitively impaired old-old adults is particularly encouraging because it has been shown that people with cognitive impairments are often poor at free recall tasks (Sanders, Creaton, Bird, & Weber, 1997). Nevertheless, the fact that the ECI and MCI did not enhance recall in the questioning phase of interviews is contrary to Milne et al.'s (1999) observation that *both* the free recall and questioning phases of the CI resulted in improved recall. In part, however, this discrepancy is likely due to differences among the participants tested in each study. The cognitively impaired participants in Milne et al. (1999) attended a day centre for the learning disabled and had significantly impaired social functioning. Participants in the present sample had a diverse range of age-related cognitive impairments (see Section 6.3.4). The learning disabled might be better equipped to process the imagery instructions given during the questioning phase of the ECI and MCI than individuals who have age-related cognitive impairments (e.g., dementia). Differences in the structure of the CIs used in each study may also have contributed to this observed discrepancy. Milne et al. (1999) administered the *change order* and *change perspective* mnemonics at the end of the interview, after the questioning phase (unlike Memon et al., 1997a, these mnemonics were separate from the questioning phase). The present study, however, included the *change order* and *change perspectives* mnemonics in the free recall phase. It is possible, therefore, that the participants in Milne et al.'s (1999) CI condition had more concentration during the questioning phase than those in the present study because they had performed fewer tasks up to this point. The present participants were also substantially older than those tested by Milne et al. (1999) which might have contributed to this effect.

In terms of detail types, both MMSE groups recalled more correct Action, Person, and Object information with the MCI and ECI than with the SI. Interestingly, however, a different pattern of results was observed for correct Surrounding details. Individuals with high MMSE scores recalled more correct Surrounding information with the ECI than with the MCI, and more correct Surrounding information with the MCI than with the SI. For those with low MMSE scores, on the other hand, there were no significant differences in the amount of correct Surrounding details recalled across each interview condition. This suggests that the MCI and ECI are only useful for increasing the recall of correct Surrounding information among individuals with high MMSE scores. It also implies that changes in retrieval strategies do not alter the low MMSE group's recall for Surrounding details, which further implies that individuals with low MMSE scores might have difficulty encoding Surrounding information in the first place. Future research could examine this issue.

No interview differences were observed in the overall number of incorrect details recalled by either MMSE group (cf. Brown & Geiselman, 1990, and Milne et al., 1999). Furthermore, neither MMSE group reported more confabulations in an ECI or MCI than in a SI. This finding is contrary to Brown and Geiselman (1990) and Milne et al. (1999), who both observed that the CI resulted in a small increase in the number of confabulations made by cognitively impaired participants. This discrepancy may partly be due to the fact that the present study considered uncertain responses separately from all other responses. Finally, it was observed that the recall of both MMSE groups was more accurate and complete with an ECI and MCI than with an SI. Overall, such results suggest that the ECI and MCI do improve the recall of cognitively impaired older adults.

6.3.3 – Is the ECI or MCI more effective with old-old adults who have low MMSE scores?

Old-old adults with low MMSE scores recalled 26% more correct information in an ECI and 41% more correct information in a MCI. On the other hand, it was found that participants with high MMSE scores recalled 31% more correct information with the ECI and 18% more correct information in a MCI. This reveals that while the ECI elicits more correct information than the MCI when used with high MMSE individuals the reverse is true for those with low MMSE scores. The only difference between these two interviews is use of the change perspective mnemonic. Hence, this indicates that the *change perspective* technique does not benefit the recall of impaired old-old adults. One explanation for this observation may be that impaired older adults have difficulty understanding the *change perspective* instructions. Indeed, only 4 of the 11 participants who had low MMSE scores and who were given an ECI used this technique without difficulty. The rest either said they did not understand what was being asked, or interpreted the mnemonic as an instruction to describe how another witness was *feeling*. Even when the interviewer repeated the instructions, they were still misunderstood. The MCI, which elicits more correct information from impaired older adults than the ECI with no difference in recall accuracy, may, therefore, be the most appropriate version of the CI to use with this group.

6.3.4 – The nature of cognitive decline among participants with low MMSE scores

A low MMSE score is indicative of poorer than average cognitive functioning. However, use of the MMSE alone is not sufficient to determine the aetiology of this cognitive decline (Folstein et al., 1975). It is therefore possible that the cognitively impaired participants tested in this study were suffering from a diverse range of disabilities.

To obtain additional information about the nature of participants' cognitive impairments low MMSE scorers were re-contacted. In total, 19 of the 36 participants in this group were visited 11-13 months after their initial testing session. Three of the remaining participants had died, one was hospitalised, one had moved, and the rest could not be contacted. To determine whether low MMSE scores were the result of depression-induced cognitive decline, re-contacted participants were asked to complete the BDI-II (Beck et al., 1996). In addition, because progressive decline in cognitive function is often associated with the presence of dementia (Howieson et al., 2003), the MMSE was re-administered and MMSE scores from Time 1 and Time 2 were compared.

To determine whether low MMSE scores could be attributed specifically to semantic dementia or to Alzheimer's dementia, participants were given the PPT (Howard & Patterson, 1992) and an adaptation of the PPT (Simons, Graham, & Hodges, 2002). As noted in Study 3, poor performance on the PPT can reflect the presence of either semantic or Alzheimer's dementia (Hodges & Patterson, 1995; Simons et al., 2002). The adapted-PPT, however, specifically detects Alzheimer's dementia. Participants who score low on both the PPT and adapted-PPT (or only low on the adapted-PPT) are likely to have Alzheimer's dementia. Those who score low on the PPT but *not* the adapted-PPT are likely to have semantic dementia (Simons et al., 2002). In the adapted-PPT, participants are presented with 49 pairs of pictures, 15 minutes taking the PPT. One picture in each pair is a target picture from the PPT (e.g., pyramid) and the other picture is a previously unseen, but semantically related picture (e.g., sphinx). Items that appear more than once in the PPT are omitted from the adapted-PPT. For each pair of pictures, participants are asked to indicate which picture they had seen previously. In the present study, adapted-PPT scores of less than 40 were considered indicative of cognitive decline (cf. Simons et al., 2002). A test for Alzheimer's dementia was given because this form of dementia is the most common and was therefore a likely cause of cognitive impairment among participants. Distinguishing between participants with Alzheimer's and semantic dementia was considered important because each form of dementia has a unique aetiology that could have differentially affected recall of the to-be-remembered video. Individuals with Alzheimer's dementia suffer primarily from episodic memory deterioration, which disrupts the ability to remember personally experienced events (e.g., watching a video). Those with semantic dementia have difficulties remembering knowledge about the world, such as the meaning of different words, concepts and facts (Simons et al., 2002).

At re-test, 11 participants had lower MMSE scores than at Time 1, and also showed signs of Alzheimer's dementia. Three participants showed signs of Alzheimer's dementia without a corresponding decrease in MMSE score. One individual showed signs of both depression and Alzheimer's dementia, while another had a lower MMSE score than at Time 1 and showed signs of both depression and Alzheimer's dementia. Only one participant appeared to have semantic dementia. Two participants did not experience a decline in MMSE score and did not present symptoms of depression, Alzheimer's dementia, or semantic dementia. Mean scores on the MMSE (Time 1), MMSE (Time 2), BDI-II, PPT, and adapted-PPT are shown in Table 6.8. A marginally significant paired samples t-test revealed that mean MMSE scores at Time 2 ($M = 21.00$) were lower than at Time 1 ($M = 22.68$).

Table 6.8

Mean, standard deviation (SD) and range of BDI-II, MMSE (Times 1 and 2), PPT and adapted-PPT scores for re-contacted old-old adults (N = 19)

	BDI-II	MMSE (Time 1)	MMSE (Time 2)	PPT	Adapted PPT
Mean	10.89	22.68	21.00	47.18	31.33
SD	9.30	3.80	3.42	3.60	12.15
Range	0-39	13-26	15-26	37-52	5-49

Although it would be interesting to examine the recall of participants who had Alzheimer's dementia, semantic dementia and depression, there were insufficient participants in each group to enable such comparisons. It is also important to note that there was a long delay (11-13months) between Times 1 and 2. Consequently, test results at Time 2 are not necessarily a good indication of their performance at Time 1. For example, participants who were not depressed during the initial testing phase may have been depressed at Time 2 (e.g., because a spouse had recently passed away). Conversely, participants who *were* depressed at Time 1 may have improved by Time 2 (e.g., because of therapy or medication). Future studies to consider a cognitively impaired older adult sample should obtain information about the specific nature of participants' cognitive decline at the initial testing session, or shortly thereafter.

Even though it is not possible to make specific claims about the nature of participants' cognitive impairments, the results of the present study are still useful from a practical perspective. They suggest that older individuals whose cognitive ability is below average can benefit from the CI mnemonics, and can be accurate eyewitnesses. Indeed, it is likely that investigating officers do not always know the underlying causes of impairment in the older witnesses they encounter.

6.4 – Chapter Summary

The present study examined the quantity and quality of old-old adults' recall for a video as a function of interview type (ECI, MCI, SI) and cognitive ability (low MMSE score, high MMSE score). As predicted, the ECI and MCI elicited recall that was superior to that of the SI for participants in both MMSE groups. Interestingly, however, the MCI benefited those with low MMSE scores more than the ECI, which demonstrates that this group may have difficulty using the *change perspective* technique. It is important to note, however, that the present findings are based on only a small sample of participants. Further research, involving a larger group of older adults with specific cognitive impairments (e.g., those who have been clinically diagnosed with dementia) would be useful.

As described in Study 2, education level has not been clearly associated with eyewitness recall performance or with performance on the CI (e.g., Geiselman et al., 1984; McMahon, 2000). However, Adams-Price (1992) demonstrated that age differences in recall can be reduced if participants are matched for education. It is therefore possible that participants' level of education influenced the present results. To determine whether this was the case, several participants were re-contacted (19 individuals with low MMSE scores and 29 individuals with high MMSE scores) and asked about their level of education. The education level of individuals with low (M = 10.0-years, SD = 2.11) and high (M = 10.31-years, SD = 1.73) MMSE scores was not significantly different, t (45) = .55, p = .59.

In the next, and final, chapter of this thesis the main observations from Studies 1 through 4 will be summarized and examined in light of age-related memory decline theories. Practical implications of these findings will also be described, the limitations of each study will be examined, and future areas of study will be considered.

Chapter VII:

General Discussion

This chapter summarizes the research conducted in this thesis and describes the main findings that were observed. In addition, it examines how these results increase current understanding of age-related memory decline, and explores the implications of using the Cognitive Interview with older adult eyewitnesses. Next, some of the methodological limitations of the present research are addressed and future areas of study are considered.

7.1 – Summary of Research and Findings

Older adults represent a sizeable and important group of witnesses (British Crime Survey, 2003; Brogden & Nijhar, 2000; Jenkins et al., 2000). To date, however, this group has received little attention in the eyewitness research literature. The present thesis addressed this limitation. Specifically, it reviewed the problems older adults encounter when recalling a witnessed event and examined the use of the Cognitive Interview (CI) (cf. Fisher et al., 1984; Fisher & Geiselman, 1992; Geiselman & Fisher, 1987) to improve the quality and quantity of older adults' recall. Unlike other interviewing protocols (e.g., hypnosis, Narrative Elaboration, the NICHD interview, the Step-wise interview, conversation management) extensive research has demonstrated that the CI generally enhances recall among young adults (e.g., Köhnken et al., 1999), children (e.g., Holliday, 2003a, b; Milne & Bull, 2003), cognitively impaired young adults (e.g., Milne et al., 1999), and cognitively impaired children (Milne & Bull, 1996).

In particular, the present thesis tested the Enhanced CI (ECI) and a modified version of the CI (MCI) with young, young-old and old-old adults. The MCI was identical to the ECI except that the *change perspective* mnemonic was omitted. This technique has been criticised in the past (e.g., Boon & Noon, 1994). Moreover, it has been shown that older adults are poorer at perspective-changing tasks than younger adults (e.g., Herman & Coyne, 1980). The present thesis also determined whether the ECI and MCI were beneficial for older adults who show signs of cognitive impairment. Such individuals have largely been ignored in the eyewitness literature despite the fact that they are particularly susceptible to crimes like abuse and neglect (Coyne, 2001; Lachs et al., 1997).

First, however, the opinions and suggestions of individuals who regularly interview older adults were sought. In Study 1 (Chapter III) a survey was conducted to explore United Kingdom police perceptions about older witnesses, and to ascertain the interview techniques routinely used with such witnesses. Officers were also asked to describe the interviewing difficulties they encounter with older witnesses and to express their attitudes about using the CI with this group. Interestingly, over half the officers believed that older witnesses are less reliable and less thorough than young adult witnesses. The greatest challenges officers face when interviewing older adults were reported to be: Witness distress; memory loss; lack of time to conduct a proper interview; and keeping the witness focussed. Only 36% of the officers believed that the CI would be useful with older adults. Many of these officers stipulated that the CI would *only* be useful if the CI mnemonics were carefully explained and if the witness was not intellectually impaired. A further 37% of officers stated that the CI would not be useful with older adults because it is too time consuming, arduous, and emotionally distressing.

Study 2 (Chapter IV) compared the recall of young (17-31-years), young-old (60-75-years), and old-old (75-95-years) participants for a videotaped event with a typical police interview (Structured Interview, SI) (cf. Köhnken, 1993), the ECI and the MCI. In this study, the limitations of earlier research involving older adults and CIs (e.g., small sample size; McMahon, 2000) were addressed. Young adults recalled more correct information than young-old adults, who recalled more correct information than old-old adults. The differences in young-old and old-old adults' correct recall stemmed primarily from the questioning phase. Young adults, however, recalled more correct details than young-old and old-old adults in both interview phases. There were no age differences in the number of incorrect or confabulated details recalled. In addition, the recall of young adults was more complete than that of young-old adults, which was more complete than that of old-old adults. Young adults were also more accurate than young-old and old-old adults, although no such difference was found between young-old and old-old adults. Encouragingly, the ECI increased correct recall by 20% for young adults, 27% for young-old adults, and 18% for old-old adults. Similarly, the MCI increased correct recall by 14%, 17%, and 15% for young adults, young-old adults, and old-old adults, respectively. These beneficial effects stemmed primarily from the free recall phase of interviews. For each age group, no differences were observed in the number of incorrect details recalled with each interview type, although the SI elicited more confabulated details than the ECI and MCI. ECI-recall was also more complete than MCI-recall, which was more complete than SI-recall. In addition, recall with the ECI and MCI was more accurate than with the SI. These observed age and interview effects remained when interviews were re-coded using a scheme that reflected the investigative relevance of reported details (i.e., coding scheme incorporated input from police officers).

Study 3 (Chapter V) replicated the results obtained in Study 2 when education level was considered, depressed individuals were screened from the sample, and interviewer-interviewee rapport was assessed. Even though Study 3 used only young (18-31-years) and young-old (60-75-years) participants, results generally paralleled those of Study 2, with two exceptions. First, concerning accuracy, Study 3 failed to find age differences between young and young-old adults, whereas Study 2 found that young-old adults were less accurate than young adults. Second, Study 3 revealed that the ECI and MCI elicited slightly fewer incorrect details than the SI, whereas Study 2 found no such differences between these interviews.

Finally, Study 4 (Chapter VI) determined whether the ECI and MCI were beneficial for older adults who displayed signs of cognitive impairment. Specifically, Study 4 compared the use of the ECI, MCI and SI with old-old (75-96-years) adults who scored high (> 26) and low (0-26) on the Mini-Mental State Exam (MMSE; Folstein et al., 1975), which is a test to assess cognitive functioning. Participants with high MMSE scores recalled more correct information than those with low scores, although these groups did not differ in terms of the number of incorrect or confabulated details recalled. However, the uncertain responses (e.g., "I'm not sure but...") of the low-MMSE group contained more confabulations than those of the high-MMSE group. Overall, the recall of low-MMSE scorers was less complete and less accurate than high-MMSE scorers. The low-MMSE group recalled 26% more correct information with the ECI and 41% more correct information with the MCI. These effects stemmed primarily from the free recall phase. The amount of incorrect and confabulated information reported by the low-MMSE group did not differ across the ECI, MCI, or SI, and recall completeness and accuracy was greater with the ECI and MCI than with the SI.

7.2 – Police Perceptions of Older Witnesses

Studies that have examined mock-jurors' perceptions of older witnesses have shown that this group is generally believed to be more honest, but less accurate and credible than younger witnesses (Brimacombe et al., 1997; Kwong See et al., 2001; Ross et al., 1990). Few studies have focused on police perceptions of older witnesses (Yarmey, 1984; Yarmey & Jones, 1982) despite the fact that such perceptions can influence decision-making (Nunez et al., 1999) and could, therefore, influence the direction of an investigation. Contrary to studies involving mock-jurors, both Yarmey and Jones (1982) and Yarmey (1984) found that Canadian police officers expressed positive attitudes about the accuracy of older witnesses.

In Study 1 of this thesis, police officers stated that older witnesses were generally less reliable and less thorough than younger witnesses. This finding is in accord with previous research involving mock-jurors (e.g., Brimacombe et al., 1997; Ross et al., 1990), but is inconsistent with the work of Yarmey (e.g., Yarmey, 1984; Yarmey & Jones, 1982). Discrepancies between the present results and those of Yarmey and colleagues, however, can be explained, in part, by methodological differences between studies. First, the number of officers surveyed in the present study was substantially larger than that surveyed by Yarmey and colleagues. Second, Yarmey's studies were conducted several years ago and examined officers from a particular geographical region in Canada. The present sample was recent and British. Third, Yarmey (1984) combined measures of honesty with measures of testimony quality. This is problematic, because it has been shown that perceptions of older adults' honesty and perceptions of their ability to accurately remember information are completely different (e.g., Brimacombe et al., 1997).

7.3 – Capacity of Older Adults to Act as Eyewitnesses

The results of Studies 2 and 3 demonstrated that police perceptions about the reliability and thoroughness of older adult witnesses were substantiated. Overall, young participants *did* recall more correct information about the to-be-remembered event than either young-old or old-old adults, with no differences in the amount of incorrect or confabulated information recalled. The observation that advancing age leads to a decline in recall ability is consistent with the findings from conventional memory tests, such as the recall of word lists (Jacobs et al., 2001), prose passages (Carlesimo et al., 1998), and sentences (Nyberg et al., 1996). It also corresponds to the results of previous eyewitness recall studies (e.g., Brimacombe et al., 1997; List, 1986; Yarmey & Kent, 1980).

A more detailed analysis of recall in each interview phase revealed substantial differences between young-old and old-old adults. Old-old adults recalled fewer correct details than young and young-old adults across both the free recall and questioning phases. The correct recall of young-old adults, however, was only poorer than that of young adults in the questioning phase. Such results support the view that cognitive functioning in very late life is different from that experienced at the beginning of old age (e.g., Baeckman et al., 2000; Korten et al., 1997). In turn, this implies that the tendency for eyewitness (and general memory) research to consider older adults as a single, undifferentiated group (e.g., Coxon & Valentine, 1997; List, 1986; Mello & Fisher, 1996; McMahon, 2000) is inappropriate. Future studies with older adult participants should consistently distinguish between young-old and old-old adults (cf. Brimacombe et al., 2003; Memon et al., 2004).

The observation that young-old and old-old adults recalled less correct information than young adults in the free recall phase suggests that the ability to freely recall information begins to deteriorate in young-old age. Although much research has demonstrated that older adults are poorer at free recall than young adults (e.g., Smith, 1977; Yarmey &Yarmey, 1997), such studies can be criticized on the grounds that they combined young-old and old-old adults in a single age category, and were, therefore, less sensitive at detecting age-related trends in free recall.

The observation that young-old and old-old adults recalled fewer correct details than young adults in the questioning phase could reflect age-related difficulties in answering specific questions. Indeed, when older adults are tested using a question-answer format (e.g., written responses to a set list of questions, Coxon & Valentine, 1997; questionnaire, Yarmey & Kent, 1980) they tend to produce more incorrect responses than young adults. Question-answer assessments may make older adults more aware that their memory is being assessed. Such an emphasis on testing could increase the salience of negative age-related memory stereotypes and may adversely affect recall performance (Hess et al., 2003). The questioning phase could have been perceived to be more "test-like" than the free recall phase, thereby causing older adults to be more sensitive to negative stereotypes. However, it is also possible that older adults simply did not remember as many details about the to-be-remembered event as young adults, so had less information to add by the time the questioning phase was reached.

7.4 – Older Adult Witnesses with Memory Disorders

A substantial proportion of older adults have some form of cognitive impairment (Alzheimer's Society, 2000). Such individuals are particularly susceptible to abuse and neglect (Coyne, 2001; Lachs et al., 1997), and may be the only witnesses to crimes against others with disabilities (Milne & Bull, 2001). Study 4 of the present thesis demonstrated that impaired older adults recalled less correct information than non-impaired older adults, although both groups reported the same number of incorrect and confabulated details. Hence, as is the case with children (e.g., Holliday, 2003a, b), the recall difficulties of impaired older adults are primarily due to errors of omission, rather than errors of omission. Such findings are similar to studies that have compared the recall of cognitively impaired and non-impaired younger adults (e.g., Brown & Geiselman, 1990; Milne et al., 1999; Gudjonsson & Clare, 1995).

Study 4 also demonstrated that cognitively impaired older adults are less accurate than non-impaired individuals. However, the former tend to achieve accuracy rates that are similar to, and sometimes better than, those of children (e.g., Akehurst et al., 2003). Since children are now generally regarded to be reliable witnesses, it is reasonable that those with cognitive impairments should also be considered reliable (Milne et al., 1999). One particularly interesting finding of Study 4 was that the uncertain responses (i.e., "I'm not sure, but I think that...") of impaired individuals contained marginally more confabulated details than the uncertain responses of controls. This implies that the uncertain responses of cognitively impaired individuals should be treated more cautiously than those of non-impaired individuals. As confabulated uncertain responses occurred primarily in the questioning phase, it might be beneficial for interviewers to periodically remind impaired witnesses that they should not guess at, or fabricate, information during this phase.

7.5 – Older Adults and the Cognitive Interview

Many of the officers surveyed in Study 1 stated that cognitive interviewing techniques are not appropriate for older adults, especially those who have cognitive impairments. Specifically, officers maintained that the CI is too difficult and too distressing for older witnesses. Overall, however, the results of Studies 2, 3 and 4 demonstrated that the ECI and MCI do improve the recall of young-old, old-old, and cognitively impaired old-old adults. Compared to the SI, the ECI and MCI increased the amount of correct details recalled by all groups of older participants, with no increase in the amount of incorrect or confabulated information recalled. The ECI and MCI also improved the accuracy and recall completeness of older adults. This implies that the CI mnemonics are not as difficult for older adults to understand or perform as officers from Study 1 believed.

Apart from the present research, only three published studies have assessed the CI with older eyewitnesses (McMahon, 2000; Mello & Fisher, 1996; Searcy et al., 2001). Mello and Fisher (1996) found that an ECI elicited more correct information about a film stimulus than a standard police interview, regardless of age (young: 18-35-years, old: 65-80-years). No differences in the accuracy of each interview were observed. In contrast to the present research and other ageing and recall studies (e.g., Brimacombe et al., 1997), however, Mello and Fisher (1996) found no age-related decline in recall ability. Furthermore, unlike the present research, older adults' recall using an ECI was not significantly different from that obtained with an MCI.

Some of the discrepancies between Mello and Fisher (1996) and the present thesis might be attributed to the fact that Mello and Fisher's older participants were recruited from a continuing education course at a local university, and were, therefore, not representative of the general aged community. Similarly, Mello and Fisher's (1996) failure to find recall differences with the ECI and MCI may reflect the fact that their MCI was different from the one used in the present research. Whereas the MCI included in this thesis was identical to the ECI apart from the exclusion of the *change perspective* mnemonic, the MCI used by Mello and Fisher omitted the *change perspective* mnemonic, shortened the free recall phase, slowed the pace of the interview, and ensured that questions were worded simply. Some of these modifications (e.g., using a simple vocabulary and a slow pace) could have compensated for the loss of the *change perspective* mnemonic, thereby making the ECI and MCI equally beneficial. Alternately, it is possible that the *change perspective* mnemonic did not greatly influence recall (although see Section 7.5.2).

McMahon (2000) compared the recall of younger (18-50-years) and older (60-88-years) adults who were given a SI or an ECI. Similar to the present research, McMahon observed that younger adults recalled more correct information than older adults. Unlike in the present research, however, the ECI did not significantly improve the recall of either age group. Again, this discrepancy might be explained by limitations in McMahon's study. First, only a small number of participants were assigned to each condition (40 participants split across 4 conditions). Second, participant age ranges were extremely large (i.e., 32 years for younger, 28 years for older participants). Third, McMahon acknowledged that the video stimulus used in her study could have been inappropriate because it was long and complex. Finally, McMahon questioned the calibre of her ECIs because these had not been subjected to 'quality control' tests such as the ones conducted in the present thesis.

Searcy et al. (2001) compared the effects of the CI and SI on the recall of older adults. Younger (18-30-years) and older (62-79-years) adults interacted with a confederate for 20 minutes and viewed three different videos. One month later, participants were interviewed about the previous session using a SI or a modified version of the CI in which the *change order* and *change perspective* mnenomics were omitted. As in the present research, young participants recalled more correct information than older adults. Unlike the present research, however, recall did not differ between the MCI and the SI. This may be because the modified CI used by Searcy et al. (2001) was not as effective as a complete CI, or because it was not as effective as an MCI that omitted only the *change perspective* mnemonic. It has been suggested that individual CI mnemonics work additively, or that a combination of several mnemonics are necessary to enhance recall (e.g., Milne & Bull, 2002). It is also possible that a one-month delay between the stimulus event and interview was too long for some of the CI mnemonics to be helpful (e.g., Flin et al., 1992). In particular, context reinstatement might only be useful after short delays when associations between the stimulus and its context are stronger (Hashtroudi et al., 1989; Searcy et al., 2001). Indeed, Köhnken et al.'s (1999) meta-analysis demonstrated that as the delay between the stimulus event and interview increases, the effect size for correct details decreases. Nevertheless, Köhnken et al. cautioned that their conclusions were limited by the fact that only two of the studies included in the meta-analysis used delays greater than seven days (three weeks, Aschermann et al., 1991; two weeks, Memon et.al., 1996).

7.5.1 – Why does the Cognitive Interview benefit older adults?

The fact that the CI is able to consistently improve the recall of many different witness populations such as children (Holliday, 2003a, b) and cognitively impaired individuals (Milne et al., 1999) is not surprising because the interviewing techniques incorporated in the CI apply to most individuals (Fisher et al., 2002). For example, CI interviewers are instructed to primarily use open-ended questions (Fisher & Geiselman, 1991), which are typically associated with much higher rates of response accuracy than other (e.g., closed / forced-choice) question types (Fisher, 1995; Fisher et al., 2002). Certain aspects of the CI may particularly benefit the recall of older adults. In the following discussion, each of these features will be addressed in terms of prevailing theories about age-related memory decline.

The Speed of Processing approach (e.g., Salthouse, 1985) argues that memory deterioration in advancing age is due to the progressive slowing of cognitive functions. Allowing older adults sufficient time to process cognitive tasks is therefore essential for optimal performance. The CI emphasizes that the witness, rather than the interviewer, should control the pace of the interview (i.e., *transfer control*) and ensures that retrieval processes are not rushed. This reduces time pressures, and may consequently make older adults' retrieval more effective.

Other theories of age-related memory decline maintain that advancing age is associated with a reduction in attentional resource availability (Hashtroudi et al., 1990), or a deterioration of working memory capacity (Salthouse et al., 1989). Having a limited pool of resources to cope with cognitive tasks, older adults perform better when activities are uncomplicated and when their attention is not divided (e.g., Anderson, 1999). By ensuring that witness retrieval is focused (e.g., that the interviewing environment facilitates concentration) and by asking questions that are compatible with the witness' mental representation of events, the CI decreases the cognitive demands placed on older witnesses.

Such processing theories may also explain the observation that older adults are less proficient than young adults at remembering the correct temporal sequence of to-be-remembered events (e.g., Vakir, et al., 1997). Recalling details in sequential order likely requires more cognitive resources than if recall order was unimportant. The fact that the *change order* task given in the present CIs was broken into smaller segments (i.e., participants were asked, "Can you tell me the very last thing that happened? What happened before that? And before that? …", rather than being given a single instruction to, "report the events in reverse order") could have made this technique more manageable for older participants.

The environmental support hypothesis (e.g., Craik & Jennings, 1992) proposes that older adults are less able to engage in self-initiated remembering processes (e.g., retrieval searches). According to this theory, the memory performance of older adults is greatly influenced by the amount of retrieval support available from the environment. When extensive contextual cues from the original event are present in the retrieval environment, age-related recall deficits are reduced (Sharps & Antonelli, 1997). The CI, which uses a series of elaborate retrieval techniques, including the instruction to mentally recreate the environmental, cognitive, physiological, and affective states experienced during a to-be-remembered event (i.e., *context reinstatement* mnemonic) may provide older adults with sufficient retrieval support to enhance recall.

The associate deficit hypothesis (Naveh-Benjamin, 2000), attributes age-related memory decline to the fact that older adults are less able to form connections between to-be-remembered elements of an event, such as the characteristics of the people involved, the time and place of the event, and the internal cognitive state of the witness (e.g., mood). This theory implies that the *change order* and *change perspective* mnemonics could be less effective for older adults. Both these mnemonics are partly based on the idea that multiple pathways exist for accessing a memory. If older adults make fewer connections between the to-be-remembered elements of an event, the number of pathways available for retrieval is reduced. Nevertheless, these techniques may still facilitate older adults' recall by invoking a novel pattern of retrieval among the memory connections that *do* exist, and by reducing the effects of script knowledge (Fisher & Geiselman, 1992).

Finally, older witnesses are sometimes reported to be overly cautious (e.g., Rush et al., 1990), which may cause them to withhold information during an interview. By stressing the importance of reporting any detail, despite its perceived insignificance (i.e., the *report everything* mnemonic), the CI might overcome such difficulties (Mello & Fisher, 1996).

7.5.2 – Comparing the ECI and MCI

In Studies 2 and 3, the recall of non-impaired young-old and old-old adults was enhanced more with the ECI than the MCI. For young-old adults, the ECI elicited 10% and 5% more correct information than the MCI in Studies 2 and 3, respectively, with no increase in the amount of incorrect or confabulated information. For old-old adults, the ECI elicited 3% more correct information than the MCI, with no increase in incorrect or confabulated information (Study 2). Such observations strongly support the value of the *change perspective* mnemonic, which was the only aspect of the two interviews to differ. The observation that this technique benefits recall corroborates research by Memon et al. (1996) and Milne and Bull (2002), which demonstrated that each CI mnemonic either contributes incrementally to the CI's overall effect or interacts with other CI mnemonics to improve recall. It is also possible, however, that the act of recalling the film for a second time, regardless of the perspective taken, may have been responsible for improved recall (cf. Turtle & Yuille, 1994).

Controversy exists about whether or not the *change perspective* mnemonic should be used with older adults. Previous research has shown that older adults are generally poorer than young adults at perspective-changing tasks (Herman & Coyne, 1980; Inagaki et al., 2002). However, the instructions given during most perspective-changing studies (e.g., describe something as if, "you were standing over there") are different from the *change perspective* mnemonic, in which participants are asked to consider events from another witness' point of view. The extra instruction to "take the viewpoint of someone who had a different role in the event" could have made it easier for older participants to change perspectives. Even if older adults are worse than young adults at changing perspectives (e.g., Herman & Coyne, 1980), the *change perspective* mnemonic could still have exerted a positive effect *within* the older age groups.

Although the results of Studies 2 and 3 reveal that the *change perspective* mnemonic improves recall, this technique should still be used with caution. Unless it is properly explained, some witnesses might assume they are being asked to fabricate a response (Fisher & Geiselman, 1992). Even when the *change perspective* technique *is* correctly explained, however, it may still be difficult for certain witness populations to understand. Indeed, although the *change perspective* mnemonic does not increase error production among children, some do find it challenging to use (Akehurst et al., 2003; Saywitz, Geiselman, & Bornstein, 1992). In the present research only three non-impaired old-old adults and no young-old adults expressed doubt about using the *change perspective* mnemonic (e.g., "You want me to do what dear?").

Although the ECI elicits more correct information than the MCI when used with high-MMSE individuals, the results of Study 4 indicate that the reverse is true for those with low MMSE scores. In turn, this suggests that the *change perspective* mnemonic does not facilitate the recall of cognitively impaired older adults. Many of the impaired participants in Study 4 indicated that they did not understand this technique, or mistakenly interpreted it as an instruction to describe how another witness was feeling. It is also important to note, however, that Study 4 used a small sample of cognitively impaired older adults, with a wide range of abilities. Other cognitively impaired older adults may not have the same degree of trouble with the *change perspective* mnemonic.

7.5.3 – Free recall and the Cognitive Interview

Previous research has shown that young-old and old-old adults, as well as individuals with cognitive impairment, are less proficient at free recall than young adults (e.g., Carlesimo et al., 1998; Jacobs et al., 2001; Milne et al., 1999). Studies 2, 3 and 4, however, indicated that for each age group most of the recall enhancement observed with the ECI and MCI arose from the free recall phase. This finding is important because it shows that the ECI and MCI enhanced participants' recall in the area that was most in need of improvement.

The observation that the free recall, rather than the questioning, phase contributes more to the facilitative effects of the CI is consistent with the work of Holliday and colleagues (Holliday, 2003a, b; Holliday & Albon, 2004), but contrary to the findings of Memon et al. (1997b) and Milne and Bull (2003). These differences may be partly explained by the fact that the studies introduced the CI mnemonics at different stages in their CIs. As in the present thesis, Holliday and colleagues (Holliday, 2003a, b; Holliday & Albon, 2004; also see Roberts & Higham, 2002) included the CI mnemonics in the free recall phase, immediately after participants had finished their initial narrative. Memon et al. (1997b) and Milne and Bull (2003), on the other hand, administered the CI mnemonics in a "second retrieval" phase that was preceded by an initial free recall attempt and a questioning phase. Other methodological differences such as the use of distinct coding systems, to-be-remembered events, and retention intervals between the to-be-remembered event and interview could also be partly responsible for such discrepancies.

7.5.4 – Rapport, the Cognitive Interview and Age?

The young-old participants in the ECI and MCI conditions of Study 3 did not recall as much correct information as the young-old participants in Study 2. In both studies, however, the ECI and MCI enhanced the correct recall of young adults by approximately the same amount. Some of the cross-study variability found for young-old adults may be due to the fact that Studies 2 and 3 used different distraction tasks. In Study 3, approximately 5-10 minutes were spent conversing with participants prior to interviewing. In Study 2, 30 minutes were spent in conversation with participants. This additional time may have enhanced interviewer-interviewee rapport and increased the beneficial effects of the ECI and MCI for young-old adults. Young adults may not have required extensive rapport building (e.g., because they were roughly the same age as the interviewer, or because they were more used to participating in experiments). Interestingly, Holliday and Albon (2004) found that children (4-5-years) who were given an Enhanced Rapport MCI that included 15-minutes of rapport-building prior to the interview performed no better than children given a MCI that included 10-minutes of rapport-building. However, it could be that longer rapport-building phases (such as the 30-minute phase used in Study 2) are necessary for rapport to significantly influence interview performance. Moreover, rapport with children, young adults and older adults may be achieved in fundamentally different ways, and may take different lengths of time to establish. Future research to examine this issue would be worthwhile.

7.6 – Limitations of the Present Thesis

The present research contained various methodological limitations that need to be identified and addressed. The following discussion will examine issues that are specific to individual studies, and broader issues that apply to several studies.

7.6.1 – Study 1, Police Perceptions of the Older Witness

Although Study 1 addressed some of the problems inherent in earlier studies about police perceptions of older witnesses (e.g., by increasing sample size and representativeness), a few points should still be made about its methodology. First, most of the questions included in the survey were open-ended. While such questions give participants the opportunity to provide a wide range of responses and elicit unexpected information, the diversity of answers can make objective analysis difficult (Robson, 1999). Reliance on open-ended questions has consequently lent Study 1 a predominantly descriptive and exploratory tone. Furthermore, given the nature of the present sample (i.e., police officers who are pressed for time), it seems likely that the questionnaire would have been more effective if it had primarily contained closed questions that were quick and easy to answer. Indeed, while most officers (96%) completed all closed-ended questions in the survey (i.e., selecting an option from a scale of possible responses; answering yes / no), only 78% completed all open-ended questions. When officers did answer open-ended questions their responses were often extremely brief. Had the present questionnaire been distributed as a pilot study and then revised to include a greater number of closed questions it is likely that more officers would have answered more questions. Using a less time-consuming survey might even have encouraged more officers to complete the questionnaire in the first place, thereby increasing the response rate.

Second, a few of the questions in the survey were possibly too vague for some officers to answer easily. For example, asking officers if the current interviewing protocol is useful (question 14 of the questionnaire) assumes that they have a thorough understanding of current protocols and that they know which protocol (e.g., *Achieving Best Evidence*, Home Office, 2001) the question is referring to. Had such information been explicitly stated in the question, responses may have been more focused. Again, the use of pilot testing would likely have helped to identify and resolve such issues.

Third, in addition to asking officers how reliable and thorough they perceive older witnesses to be in general, it would have been worthwhile to present participants with specific case studies. For example, it might have been useful to examine perceptions of older witnesses when different age-related stereotypes were made salient (e.g., by describing an older witness as a distinguished statesman, grandfather, or lonely senior citizen, cf. Nunez et al., 1999). Such modifications would reflect the fact that in real life, officers are likely to encounter several different types of older witnesses, each of whom have unique social roles and varying degrees of ability. Presenting officers with individual case studies may also have affected the observed results because previous research has shown that perceptions about typical older witnesses are not always maintained when participants are asked to rate a specific older witness (Ross et al., 1990).

7.6.2 – The Ecological Validity of Studies 2, 3 and 4

In Studies 2, 3 and 4, participants watched a video and recalled it using an ECI, MCI or SI. At all times, however, participants were aware that they would have to remember the film. Hence, it is likely that participants made a deliberate effort to encode information (i.e., intentional learning occurred). This is unlike some real-life crime scenarios, in which learning is usually incidental and witnesses do not realise the importance of what they have seen until later (McMahon, 2000).

Many CI researchers do not specify whether learning was incidental or intentional (e.g., McMahon, 2000; Mello & Fisher, 1996). Others create incidental learning conditions by staging an unexpected event (e.g., classroom disruption) and then recruit witnesses as participants after the fact[2] (e.g., Gwyer & Clifford, 1997). Some initially disguise the nature of their investigation (e.g., by telling participants that the purpose of a study is to examine physiological responses to a video stimulus; Burke, Heuer, & Reisberg, 1992; or by providing vague pre-stimulus viewing instructions such as "watch carefully because you'll have to think about the video again later"; Milne & Bull, 2003). Consistent with the present research, some studies have made participants aware that they were taking part in a memory or eyewitness study (e.g., Higham & Roberts, 2002; Memon et al., 1997a).

The existence of such methodological variations makes it important to investigate whether learning type (incidental or intentional) affects recall performance. To address this issue, Migueles and Garcia-Bajos (1999) compared the quality and quantity of young (21-26-years) adults' recall after watching a video under incidental and intentional conditions. Participants in the incidental group were told that their task was to estimate the duration of several action sequences in the video, while those in the intentional group were told that they would later be asked to recall the video. The intentional group recalled approximately 27% more correct and 33% more incorrect information than those in the incidental condition. However, each groups' recall for central and peripheral details, as well as for information about

[2] However, if participants are recruited after the to-be-remembered event has been presented, it is possible that only witnesses who have particularly good memories for the incident will volunteer to be interviewed about it.

actions and person, place, object, vehicle details followed the same pattern in each condition (e.g., the proportion of action details to total details reported was similar). It was therefore concluded that intentional learning accentuates the effects of incidental learning. In turn, this implies that the results of Studies 2, 3 and 4 would be similar, albeit less pronounced, if the film had been viewed under incidental conditions.

Using a film, rather than a live encounter, as a to-be-remembered event could also have diminished the ecological validity of the present research. Watching a video may have removed participants from the immediacy of the incident and influenced the processing of to-be-remembered information. Personal involvement can facilitate memory by increasing interest, attention and reliance on self-schemas. Furthermore, rich visual and kinesthetic cues are encoded that can be used to discriminate between memory sources (Roberts & Blades, 1998). Indeed, enacting to-be-remembered information (e.g., "roll the ball") results in more correct and accurate recall than either observing or hearing about it (Mulligan & Hornstein, 2003). Similarly, individuals who participate in an event tend to remember more about it than bystanders (e.g., Baker-Ward, Hess, & Flannagan, 1990; Yuille et al., 1994). Interestingly, Köhnken et al.'s (1999) meta-analysis also demonstrated that the facilitative effects of the CI become stronger when more realistic experimental procedures are used (e.g., when a staged event rather than a film is used as the stimulus, and when participants are directly involved in the incident). This implies that results obtained in the present study would still have been observed, and perhaps even amplified, if the stimulus had been more realistic. Future studies examining the use of the CI with older adults should consider using to-be-remembered stimuli that involve actual encounters (cf. Searcy et al., 2001). Using a video stimulus does have several advantages, however. For example, it enables the researcher to accurately quantify and code all possible recallable details, and ensures that all participants witness exactly the same event, thereby providing greater experimental control.

Knowledge that the crime was staged, and that testimony would not have real consequences for the victim or suspect, might have also influenced participant motivation to recall as many details as possible. Moreover, it has been suggested that witnesses in a laboratory setting rarely experience the same magnitude of emotion as witnesses to actual crimes (Yuille & Tollestrop, 1992). According to Yuille and Tollestrop (1992), laboratory research generally involves "events of little impact", that do not create noticeable shifts in a witness' attention for the stimulus. This, in turn, is believed to cause the indiscriminate storage of peripheral and central event details. Real-life events ("events of impact"), however, are thought to focus attention mainly on central details (i.e., laboratory and real-life events are processed and remembered differently). In contrast, Christianson and colleagues (e.g., Christianson & Hubinette, 1993; Christianson, Goodman, & Loftus, 1992) argued that memory in a naturalistic setting is not different from that in a laboratory setting. They attributed discrepancies between the results of real-life and laboratory studies to the fact that each type of study tends to use different tests to measure memory performance and focuses on different aspects of memory.

7.6.3 – Using the MMSE to Assess Cognitive Impairment

Some researchers caution against using raw MMSE scores to determine whether patients or participants in clinical research trials are cognitively impaired because it has been shown that MMSE scores are related to the number of years of school completed (e.g., Baker, Gazmararian, Sudano, Patterson, et al., 2002; Magaziner, Spear-Bassett, & Hebel, 1987; Murden, McRae, Kaner, & Bucknam, 1991; Uhlmann & Larson, 1991). Specifically, the well-educated tend to achieve higher MMSE scores than others, and the MMSE can lead to false positives among individuals with less than 8-9-years of education (e.g., Anthony, LeResche, Niaz, VonKorff, & Folstein, 1982; Magaziner et al., 1987; Weiss, Reed, Klingman, & Abyad, 1995). Some researchers have suggested that educational biases in the test are responsible for such observations, and have attempted to alter MMSE cut-off values or mathematically adjust participants' scores according to their level of education (e.g., Magaziner et al., 1987; Murden et al., 1991). Since education level was unknown for many of the individuals in Studies 2 and 4, it is therefore possible that their classification into impaired and non-impaired groups was somewhat imprecise.

It is important to note, however, that several other explanations for educational differences in MMSE scores exist (Crum, Anthony, Bassett, & Folstein, 1993). For example, a limited education (and the lifestyle factors that often accompany it) can increase the risk of cognitive impairment in old age (Baker et al., 2002; Bassett & Folstein, 1991; Crum et al., 1993; DeRonchi et al., 1998; Jorm, Scott, Henderson, & Kay, 1988). It is also possible that inherent cognitive deficits or disorders are responsible for *both* educational attainment and MMSE performance. For example, a dyslexic individual may have performed poorly at school and dropped out early. Being dyslexic might also have made it difficult to perform certain MMSE tasks (e.g., drawing overlapping pentagons). In this case, poor performance on the MMSE does not necessarily result from low education. Instead, low education and poor MMSE performance are both due to an underlying disorder (Baker et al., 2002).

The practice of using education level to adjust MMSE scores is also criticized on the grounds that formal education does not necessarily reflect overall educational attainment (Baker et al., 2002). Many individuals continue their education informally after leaving school. Similarly, the quality of individuals' educational experiences may have differed. Indeed, although two people both attended high school, one may have consistently achieved high grades, whereas the other may have barely passed each course (Baker et al., 2002).

In short, the practice of adjusting MMSE scores for education is controversial. In the present thesis it may have been more prudent to compare raw and education-adjusted scores, using the most conservative measure to evaluate cognitive status. It seems likely, however, that many of the older participants in the current sample met the 8-9 year education requirement for using the MMSE (e.g., Magaziner et al., 1987; Weiss et al., 1995). Indeed, from 1914 to 1947 when most of the older participants in the present study were growing up, it was mandatory for children in the United Kingdom to attend school from the ages of 5- to 14-years (Dept. for Education and Skills, 2000).

7.6.4 – Using the BDI-II to Measure Depression in Older Adults

As described previously, Study 3 replicated the age and interview effects observed in Study 2 when education level, depression, and level of rapport with the interviewer when accounted for. Level of depression was assessed using the BDI-II (Beck et al., 1996). In the past, however, use of the BDI and BDI-II with older adults has been discouraged (e.g., Norris, Gallagher, Wilson, & Hunter-Winograd, 1987), because the BDI and BDI-II contain items that are confounded with normal ageing and age-related diseases. For example, one question asks about energy level even though it is common for non-depressed older adults to lack energy (Scogin, Rohen, & Bailey, 2000). In addition, the multiple-choice format of the BDI-II may confuse certain older individuals, especially if they have poor concentration or short-term memory skills (Norris et al., 1987). Furthermore, it has been suggested that some BDI and BDI-II questions may not be socially appropriate for older adults. For example, both scales ask participants about their sexuality, which can make older adults defensive or uncomfortable, particularly if a spouse has recently passed away (Jefferson et al., 2001; Yesavage et al., 1983).

Many researchers instead advocate using the Geriatric Depression Scale to assess older adults' depression (GDS[3]; Yesavage et al., 1983; see Appendix Z_b). The GDS includes only one somatic symptom of depression (Scheinthal, Steer, Giffin, & Beck, 2001), uses a yes / no format that requires little cognitive effort (Norris et al., 1987), and contains questions that are age-appropriate (e.g., questions about sex are avoided). Despite these advantages, the GDS does not fully address the current psychiatric criteria for depressive disorders as described in *Diagnostic and Statistical Manual of Mental Disorders-IV* (1994), which is a notable weakness (Scheinthal et al., 2001).

Notwithstanding the above concerns, recent evidence demonstrates that the BDI-II *can* effectively diagnose depression among older adults (Steer et al., 2000). Moreover, both the BDI-II and the original BDI correlate strongly with the GDS (Jefferson et al., 2001; Kogan, Kabacoff, Hersen, & van Hasselt, 1994; Olin, Schneider, Eaton, Zemansky, & Pollock, 1992). In the present thesis, no participants made negative comments about the BDI-II, therefore they likely did not perceive it to be difficult or socially inappropriate. It is important to note, however, that the older participants included in Study 3 were all under the age of 75-years and had high levels of cognitive ability as measured by the MMSE and PPT. Old-old adults and adults experiencing cognitive decline might find the BDI-II more complicated and worrying[4]. In such cases, the GDS may be a better measure to use. Nevertheless, McGivney, Mulvihill and Taylor (1994) suggested that the GDS is less valid and reliable when used with populations that have cognitive impairment.

[3] The GDS consists of 30 questions and generally takes approximately 5-10 minutes to administer. Typically, scores of 11-30 are used to indicate depression (Scogin et al., 2000).
[4] None of the participants who were re-tested in Study 3 indicated any such concerns.

7.6.5 – The Film Stimulus

All participants viewed the same film about an attempted car theft. This film was designed to contain a number of schema-consistent (e.g., the manner in which the hooligan attempted to open the car) and inconsistent (e.g., little boy dropped candy) events, and involved actors of several different age groups to avoid potential age-biases (e.g., Wright & Stroud, 2002). However, it is not known whether the use of a different film would have elicited a different pattern of responses from participants (McMahon, 2000). The consistent results found in some CI studies (e.g., Geiselman et al., 1984; 1986; Geiselman & Padilla, 1988) have been attributed partly to the fact that these used the same to-be-remembered stimulus (McMahon, 2000). Studies that *do* use different stimulus scenarios report variable effect sizes (Bekerian & Dennett, 1993). Specifically, large effects tend to be reported for dense scenarios in which many actions occur simultaneously, while smaller effects are often associated with scenarios that have sequential action patterns and few events occurring at any one time[5] (Geiselman et al., 1985; for further discussion, see Bekerian & Dennett, 1993; McMahon, 2000).

Consequently, it might have been worthwhile to use different stimuli in Studies 2 and 3. Indeed, a second video (purse-snatching in a park) was created with this intention, but it was decided that altering both the video and the distraction task would have introduced too many simultaneous procedural changes. For Study 3, the option of keeping the distraction task unchanged and administering the BDI-II, MMSE, and PPT at the end of testing session was also considered. However, this would have made the already lengthy testing session even more arduous for participants. Future studies that examine the efficacy of the CI in relation to varying crime stimuli might be informative.

7.6.6 – Use of a Forensically Relevant Coding Scheme

The age and interview effects found in Study 2 were re-examined using a police-based coding scheme. On two separate occasions, officers were asked to determine which aspects of the video they deemed relevant for a criminal

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[5] According to Bekerian and Dennett (1993), scenes that contain less information may be easier to retrieve. Similarly, it may be easier to remember actions when these are sequentially (and causally) linked (e.g., when retrieval is schema-guided). Bekerian and Dennett proposed that the CI may have little effect on memory for simple, schema-consistent scenes, because in these cases, retrieval is not demanding in the first place, and can be accomplished relatively well with few external aids.

investigation. Points that were identified as being important by more than three officers were used (by the researcher and an independent rater) to divide the original coding scheme[6] into relevant and peripheral information. However, this reliance on the original coding scheme and degree of researcher involvement likely imposed certain restrictions on the coding template (i.e., it was not completely generated by officers). Instead, it may have been more appropriate for officers to each devise their own exhaustive coding scheme. The items from these individual coding schemes could have then been collapsed into a single template and used to analyse interview transcripts. Initially, it had been hoped that officers *would* generate something of this nature. Often, however, officers' responses did not contain the level of detail necessary for a coding scheme. This made it necessary to map officers' responses onto the original (researcher-generated) coding template. If the task had been explained more thoroughly, and if officers had been given an example of the amount of detail desired (cf. Roberts & Higham, 2002), this problem might have been overcome.

7.6.7 – The Interviewer

The researcher conducted all of the interviews in the present thesis. Her expectations could, therefore, have influenced the amount and accuracy of information recalled in each condition. Specifically, interviewer expectations can result in systematic differences in the length of interviews or in the number of questions asked in interviews from each condition (Hayes & Delamothe, 1997). Similarly, researcher expectations might influence the quality of the interviewing techniques used or the level of rapport established with participants from different conditions.

Previous studies have minimized the problems associated with interviewer expectations by asking several trained assistants who are unaware of the research hypotheses to conduct interviews (e.g., Milne & Bull, 2002; Searcy et al., 2001). In the present thesis, however, limited resources meant that this was not an option. Instead, interview duration, the number of questions asked in each interview, interview quality and participant-interviewer rapport were determined and any factors that affected recall were included as covariates in analyses. Using a single

[6] This scheme represented an exhaustive list of all the details in the video and was used in Studies 2, 3 & 4.

interviewer is not uncommon in CI research (e.g., Akehurst et al., 2003; Holliday & Albon, 2004; McMahon, 2000) and is sometimes considered to be advantageous because it eliminates variability caused by individual differences between interviewers (Akehurst et al., 2003; Memon et al., 1996).

A related issue is whether the researcher had received adequate training in each interviewing technique. Interviewer training can affect the quality of an interview and, by extension, can influence recall (Fisher et al., 1994). When CI interviewers have attained a certain level of proficiency (e.g., through training), their cognitive load during an interview is reduced. In turn, this is expected to make interviewer errors less likely (Köhnken, 1995; Memon & Higham, 1999). Interestingly, however, research by Köhnken et al. (1995) revealed that interviewer experience (defined by the number of interviews conducted) did not influence the recall of correct, incorrect or confabulated information.

The definition of adequate training has continually evolved throughout the history of the CI (McMahon, 2000; Memon & Higham, 1999). Most early CI studies used brief training sessions (e.g., interviewers were provided with a set of written instructions and attended a 30-minute question-answer session; Geiselman et al., 1985). Recent research, on the other hand, tends to involve several training sessions that each last for a few hours. In such sessions, the underlying theories of the SI and CI are explained, trainees are given the opportunity to practise the techniques and are given feedback about their interviewing performance (e.g., Akehurst et al., 2003; Memon et al., 1997a)[7]. The present researcher (who had previously been taught about the CI at the post-graduate level) studied relevant interviewing guidelines (e.g., Fisher & Geiselman, 1992; Köhnken, 1993) extensively before conducting numerous practise interviews with older adults. These interviews were evaluated and discussed with other trained individuals. Although such training is not as extensive as that given in some studies (e.g., Memon et al., 1992), it was nevertheless consistent with (and in the case of early CI studies better than) the standards described in the literature (e.g., Holliday, 2003a, b; McMahon, 2000).

[7] The type and length of training received do not necessarily predict subsequent interviewing ability. Memon et al. (1994) noted that personal attitudes, motivation and prior experience also play a large part in the success of an interview training program.

7.7 – Future Research Directions

Some of the most logical extensions of the present research were discussed in Section 7.5 (e.g., using a more realistic to-be-remembered event, testing the CI with participants whose cognitive impairments have been clinically identified). However, it is recommended that future studies examine older adults' recall with the CI when the delay between viewing the incident and remembering is increased, and when participants have been exposed to post-event misinformation. Future studies could also focus on the use of alternate interviewing techniques with cognitively impaired older witnesses, and explore witness perceptions about the CI. It would also be beneficial to examine whether officers' beliefs that the CI may be too traumatic for older adult witnesses (Study 1) are substantiated. These ideas are discussed below.

7.7.1 – Increasing the Delay Between the To-Be-Remembered Incident and Interview

In real-world criminal investigations it is not unusual for a long time to pass before a witness is interviewed (Larsson et al., 2003). However, older adults often forget information more quickly than young adults. Huppert and Kopelman (1989) found that advancing age led to a significant increase in the forgetting rate of participants (16-83-years) who were asked to recall a series of colour slides. In addition, it has been shown that forgetting rates are faster among older adults (61-88-years) with Alzheimer's disease than among those with depression, which are faster than those of controls (Dannenbaum, Parkinson, & Inman, 1988). It would therefore be beneficial to examine whether the CI is able to improve the recall of cognitively impaired and non-impaired older adults following longer retention intervals. The CI facilitates the recall of young adults even after a substantial delay between the to-be-remembered event and interview (e.g., five days, Memon et al., 1997a; two weeks, Memon et al., 1997b; three weeks, Ascherman et al., 1992). It is therefore expected that the CI will also enhance older adults' recall over similar periods.

7.7.2 – Older Adults, Suggestibility and the Cognitive Interview

Eyewitness accounts can become distorted by information that is introduced after the witnessed event (e.g., Reyna et al., 2002). Interestingly, older adults are more susceptible to the harmful effects of post-event misinformation than young adults (e.g., Cohen & Faulkner, 1989; Karpel, Hoyer, & Toglia, 2001; Mitchell et al., 2003). Mitchell et al. (2003) asked young (20-years) and older (76-years) participants to watch a video about a burglary and answer several questions about the event, some of which contained misleading information. Next, participants were asked to recognise statements that described items or events that were consistent with the video. Older adults were poorer than young adults at recognizing information from the video. Older adults were also more likely to incorrectly attribute misinformation to the video, even following explicit warnings that they had been exposed to misinformation.

Although several studies have examined the CI's ability to minimize the effects of misleading information among children (e.g., Hayes & Delamothe, 1997; Holliday, 2003a, b; Milne & Bull, 2003) and young adults (e.g., Geiselman et al., 1986; Robinson & Briggs, 1997), no research of this kind has been conducted with older adults. Considering that older adults are more suggestible than young adults (e.g., Coxon & Valentine, 1997), future research in this area might be beneficial. Previous studies with young adults and children have indicated that the CI is helpful in countering the effects of misinformation, but only if the interview is given prior to participants' exposure to misinformation (e.g., Geiselman et al., 1986; Milne & Bull, 2003; Memon et al., 1996; although see Holliday, 2003a, b). It is therefore likely that the CI will similarly protect against suggestibility among older adults.

Most suggestibility research has examined recall accuracy for events that were experienced only once (Powell & Roberts, 2002; Powell, Roberts, Ceci, & Hembrooke, 1999). Often, however, witnesses are interviewed about repeated incidents (e.g., acts of abuse that occurred over several occasions). For a conviction to be secured in the case of a repeated offence, it is necessary for the details of at least one specific incident to be adequately identified (Powell et al., 1999). Distinguishing a single occurrence from a series of events is often extremely difficult however, because witnesses must decide when particular details occurred in the sequence (Powell & Roberts, 2002). This task may be particularly hard for older adults, who are poorer than young adults at source-monitoring tasks (e.g., Ferguson et al., 1992; Johnson et al., 1993; Mitchell et al., 2003). It would therefore be useful for future studies to examine, and attempt to minimize, older adults' suggestibility after witnessing a repeated incident (e.g., by using the CI).

7.7.3 – Interviewing Cognitively Impaired Older Adults

Although the CI improved the quality and quantity of recall among cognitively impaired older adults (Study 4), it is possible that alternative interviewing techniques may be more suitable, or more beneficial, for this group. In Study 4, impaired older adults had difficulty using the CI's *change perspective* technique. Instead of simply eliminating this mnemonic from interviews with impaired older adults, future studies could modify it. Visual perspective-taking can be achieved in several ways (Langdon & Coltheart, 2001). An individual can either be asked to simulate the first-person experience associated with viewing a scene from another vantage point (viewer-rotation instructions; as in the CI), or to imagine that the scene itself has been rotated. Young children are better at answering specific questions about the relative position of items in a scene when viewer-rotation instructions are given (e.g., "which toy would be in front of the block if you were sitting over there?"). Conversely, when children are asked to *describe* a scene, their performance is better when they mentally rotate the scene itself (scene-rotation; e.g., "what would you see if we turned the table around?"; Huttenlocher & Presson, 1973, 1979). Similarly, individuals with a high degree of schizotypy[8] were more accurate at describing a scene using a scene-rotation perspective change, than when they used a viewer-rotation perspective change. No such differences were observed for low-schizotypy participants (Langdon & Coltheart, 2001). Like children and people with schizotypy, the recall accuracy of cognitively impaired older adults might be improved if the *change perspective* mnemonic of the CI encouraged scene-rotation.

In addition to modifying the CI's *change perspective* mnemonic, it would be interesting to examine the use of Narrative Elaboration (Saywitz et al., 1996; Saywitz & Snyder, 1996) with impaired older adults. Narrative Elaboration is one of the few interviewing protocols apart from the CI to have received substantial empirical support (Brown & Pipe, 2003a, b; Dorado & Saywitz, 2001; Saywitz et al., 1996). In Narrative Elaboration, a pre-interview session is used to inform witnesses about the level of detail and the type of information that are expected in an interview (Bowen & Howie, 2002). Witnesses are also trained to use cue cards to trigger retrieval (Brown & Pipe, 2003a), and are given the opportunity to practice Narrative

[8] Shizotypy refers to a non-clinical manifestation of biological and cognitive factors that, when seen in a more extreme form, cause clinical psychotic symptoms (e.g., delusions, paranoia; Langdon & Coltheart, 2001).

Elaboration techniques (Bowen & Howie, 2002). The actual interview occurs either immediately or 1-2 days after the initial session. In the interview, free recall is followed by the presentation of each cue card. With the presentation of each card, the interviewer asks, "Does this card remind you to tell anything more?" Finally, a series of specific questions are asked to clarify, or expand on, various aspects of the witness' account (Camparo et al., 2001).

Extended Narrative Elaboration practice sessions could be particularly beneficial for cognitively impaired older adults, as they may help this group feel more relaxed about the interviewing process. Furthermore, providing open-ended topic cues might help impaired individuals structure their free recall accounts. Cognitively impaired individuals often have particular difficulty with free recall tasks (Milne et al., 1999). Although Narrative Elaboration was originally designed for child interviewees (Saywitz & Snyder, 1996; Saywitz et al., 1996), the technique could be modified for use with impaired older adults. For example, because some adults may find the use of pictorial cue cards patronizing, verbal cues could be used instead.

7.7.4 – Witness Perceptions about Using the Cognitive Interview

One of the goals of Study 1 was to examine police perceptions about older witnesses so that these could be used to maximize the recall of older adults. Because an interview is an interaction between two people, however, it could be equally beneficial to determine which interview components witnesses perceive to be the most helpful or difficult. For example, although the *change perspective* mnemonic of the CI does not necessarily increase error production among children, some find this technique challenging (Akehurst et al., 2003; Saywitz et al., 1992). If an interviewee has trouble understanding a certain mnemonic it could hinder the progress of the interview (e.g., by causing the witness to lose confidence in his / her ability, or by damaging interviewer-interviewee rapport). It would be valuable for future studies to examine interviewee attitudes about different interviewing protocols (e.g., Cognitive versus Structured Interview), and about the different techniques used in each interview (e.g., how easy different CI mnemonics are to understand).

Following from this idea, future studies might consider whether the order of CI mnemonic presentation affects recall quality or quantity. Regardless of whether the CI mnemonics are given at the end of the free recall phase (cf. Holliday, 2003a, b; Roberts & Higham, 2002) or at the end of the questioning phase (cf. Milne & Bull, 2003), most studies report that the CI improves recall by approximately the same extent. It is therefore unlikely that varying CI mnemonic presentation order substantially impacts recall. Nevertheless, introducing the CI mnemonics at different stages in an interview might make the CI easier for investigators to conduct. Some officers, for example, have difficulties administering the *change order* and *change perspective* mnemonics (Clifford & George, 1996). Leaving these mnemonics until the very end of the interview (cf. Milne & Bull, 2003) would ensure that aversion to these techniques does not affect interviewing performance at other stages.

7.7.5 – Using the Cognitive Interview with Traumatized Young and Older Witnesses

Officers are sometimes uncomfortable about using the CI because they feel it is inappropriate to ask traumatized witnesses and victims to recreate vivid mental images of the event and to re-live their experience (e.g., *context reinstatement*; Milne & Bull, 1999). Some of the officers surveyed in Study 1 reported that this was particularly true for older adults, who may be more upset by a crime and the interviewing procedure than young adults. Shepherd et al. (1999) on the other hand, argued that the CI might minimize the pain associated with remembering a traumatic event. Indeed, several CI mnemonics are similar to various cognitive-behaviour therapy techniques. For example, cognitive-behaviour therapists ask their clients to repeatedly create and describe mental images of a traumatic event. This is akin to the CI's use of context reinstatement and mental imaging, and is believed to decrease arousal associated with specific memories (Shepherd et al., 1999). As in the CI, cognitive-behaviour therapists encourage the retrieval of detailed responses, give the client control over what is reported, and ask clients to recall the event several times from different points in time (Shepherd et al., 1999). Detailed imaging and repeated retrieval is thought to help organize memories meaningfully, which, in turn, makes it easier for a traumatic memory to be integrated into existing schemata (Foa & Riggs, 1993; Rothbaum & Foa, 1996).

Future studies should consider examining whether the CI *does* create more distress than control interviews, and if so, determine whether this distress is greater for older adults than for younger adults. This might be accomplished by showing younger and older participants an emotionally arousing incident (e.g., violent purse-snatching) and interviewing them with either the CI or a Structured Interview.

Participants could then complete a questionnaire about how traumatic or helpful they would have found the interviewing experience if they had actually witnessed, or been the victim of, the crime depicted. In addition, because watching a traumatic videotaped event and personally experiencing such an event would involve different levels of stress it might also be worthwhile to ask real victims of crime to rate their interviewing experiences (e.g., in terms of how helpful, therapeutic, distressing, frightening it was to talk about the incident using a CI or regular police interview). If the results of such studies reveal that a CI is not more stressful than a typical police interview, more officers may be encouraged to use this protocol. Conversely, if the CI is very distressing for certain witness groups, alternate interviewing techniques for traumatised witnesses could be tested.

Unfortunately, there is scant information about how older adults cope with traumatic events compared to young adults (Averill & Beck, 2000). Some research indicates that older adults are similar to, and occasionally better than, young adults at coping with large-scale accidents and natural disasters (see Averill & Beck, 2000, for a review). Hagstrom (1995), for example, examined young (18-24-years) middle-aged (45-64-years) and older (over 65-years) adults who had survived a train collision for symptoms of Post-Traumatic Stress Disorder (PTSD; e.g., preoccupation with the accident, avoidance, intrusive thoughts). Although older adults had more PTSD symptoms than middle-aged adults, the symptom profiles of older and young adults were similar. Furthermore, older adults (> 60-years) who had experienced a severe earthquake demonstrated greater resilience and better coping mechanisms than those under the age of 60-years (Kato et al.; 1996). Taken together, such findings reveal that age and the effects of trauma are not linearly related. Instead, it has been argued that pre-trauma psychological functioning is a better indicator of post-trauma coping (Phifer, 1990; Phifer & Norris, 1989). Specifically, Phifer (1990) found that among flood survivors, pre-flood anxiety, depression and distress accounted for 40% of the variance in post-flood symptom severity. Demographic factors (e.g., age) accounted for only 3% of the variance. Other researchers have argued that the level of social support available to victims, their interpretation of the trauma, and past experience may contribute more to coping mechanisms than age (Averill & Beck, 2000; Kato et al., 1996).

However, it is important to recognise that the psychological effects of being a crime victim and being the victim of an accident or natural disaster can be quite different. Natural disasters are experienced by entire communities so access to social support may be relatively easy (e.g., a sense of community spirit may develop). The individual victim of crime, however, may feel isolated, wonder "why me?" and blame him / herself for being vulnerable. Little research has examined how older adults cope with crime victimization (Averill & Beck, 2000), although some evidence suggests that older victims suffer more than younger victims, even when the criminal act is the same or less serious (Wolf, 2000). Older adults are also more likely to sustain physical damage (e.g., broken hip from being knocked over by a mugger) during a criminal incident (McCoy et al., 1996). Physical injury may increase the psychological impact of victimization. Recently, however, Acierno et al. (2002) found that women over the age of 55 who had been physically or sexually assaulted reported fewer negative emotional effects (i.e., PTSD symptoms, depression) following an assault than young women (18-34-years). Although such findings suggest that older adults are better able to cope with traumatic experiences than young adults, it is also possible that older adults simply have a tendency to minimize psychological symptoms (Acierno et al., 2002). Some older adults also may not acknowledge that a violent act is actually a crime. For example, older adults score higher on rape myth acceptance measures which suggests that they may not consider some incidents of coerced sexual contact to be rape or assault (Kalra, Wood, Desmarais, Verberg, & Senn, 1998).

If young and older adults do not encounter different levels of trauma after an event, it may be that re-experiencing this event such as during an interview will be no more stressful for older and young adults. As can be seen by the preceding discussion, however, knowledge about older adults' reactions to crime is currently insufficient to make such claims.

7.8 – Conclusion

The present thesis examined whether the quality and quantity of older adults' eyewitness testimony could be improved with the Enhanced Cognitive Interview (ECI) and a modified version of the CI (MCI). Importantly, it was found that the ECI and MCI *were* able to enhance the recall of young-old, old-old, and cognitively impaired old-old adults compared to an interview that is presently recommended by the United Kingdom Home Office (Structured Interview / *Achieving Best Evidence Interview*; Home Office, 2001). Specifically, the present results demonstrated that it would be beneficial for investigating officers to use the ECI with non-impaired young-old and old-old adults, and the MCI with impaired old-old adults. As expected, it was also found that recall ability declined with advancing age. Interestingly, however, the present results revealed that the recall performance of young-old and old-old adults is substantially different, which suggests that future research should continue to distinguish between these two groups.

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APPENDICES

Appendix A

Questionnaire (and introductory cover sheet) distributed to police officers in Study 1.

KENT

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QUESTIONNAIRE:
Interviewing Older Witnesses and Victims

This questionnaire is part of an ongoing research project to examine various interviewing methods that could be used to help elderly (i.e. - 60 years and older) eyewitnesses and/or victims of crime remember more about what they have seen. The purpose of the questionnaire is to gain an understanding of how police perceive and deal with older eyewitnesses.

Participation is completely voluntary, and you may withdraw from the study at ANY time without giving a reason, and without suffering any consequences for your decision. The questionnaire should take approximately 10 minutes to complete.

Names and any details which could be used to identify specific individuals will not be included in any of the reports produced from this study, made publicly available, or given to any other person. Instead, each participant will be assigned a number that will be used in all subsequent analyses and reports.

This work is being conducted as part of a PhD degree at the University of Kent, under the supervision of Dr. Robyn Holliday (phone 01227823087). If you have any questions or concerns, please do not hesitate to contact either myself or Dr. Holliday. Thank-you!

Allison M. Wright
Department of Psychology
Keynes College
University of Kent at Canterbury
Canterbury, Kent
CT2 7NP

Phone: 01227 82 7821
Fax: 01227 82 7030
e-mail: amw9@ukc.ac.uk

1) Gender –

2) Age –

3) How many years have you served with the police force?

4) What is your current rank of office?

5) Please describe (briefly) the type of training you have received for interviewing witnesses/victims of crime and how valuable you found this to be.

6) Approximately how many years experience in conducting interviews with witnesses/victims do you have?

7) What is the average time delay between a witnessed event and the first interview you conduct?

What generally leads to this delay?

8) What type of interviewing protocols do you follow when interviewing witnesses/victims of crime?

9) How often do you encounter child/adolescent witnesses or victims during the course of your duties?

0-10%
11-20%
21-30%
31-40%
41-50%
51-60%
61-70%
71-80%
81-90%
91-100%

10) How often how often do you encounter elderly witnesses/victims during the course of your duties?

0-10%
11-20%
21-30%
31-40%
41-50%
51-60%
61-70%
71-80%
81-90%
91-100%

11) In your opinion, how reliable are elderly eyewitnesses, compared to younger adult witnesses? (Please circle the most appropriate number)

1	2	3	4	5	6	7
much less reliable			similar			much more reliable

12) In your opinion, how thorough/detailed are the reports provided by elderly eyewitnesses, compared to those given by younger adults? (Please circle the most appropriate number)

1	2	3	4	5	6	7
much less thorough			similar			much more thorough

13) Please briefly explain the reasons for your choices in questions 11 and 12.

14) Do you feel that the current interviewing protocol for dealing with elderly witnesses is sufficient for meeting their needs as a witness and for facilitating your job? **YES / NO**

If not, can you suggest any improvements?

PLEASE ANSWER THE FOLLOWING QUESTIONS ONLY IF YOU HAVE HAD AT LEAST SOME EXPERIENCE INTERVIEWING THE ELDERLY:

15) When faced with an elderly eyewitness, do you generally use the same interviewing techniques as when interviewing a younger adult (i.e. is your interviewing style similar)? **YES / NO**

If not, please explain what you do differently and how well this works.

16) What are the greatest challenges you face when interviewing an elderly witness? How do you deal with these?

17) Have you ever attempted to use a Cognitive Interview with an elderly person?

YES / NO

If not, why? If you have used a Cognitive interview with an elderly witness, how effective was this?

Appendix B
Initial letter to Chief Officers, requesting assistance in obtaining participants for Study 1.

Date

Address

Dear XXX:

I am a PhD student at the University of Kent at Canterbury, working under the supervision of Dr. Robyn Holliday (phone: 01227 823087). I am presently researching various interviewing techniques that could be used to enhance elderly individuals' ability to remember a witnessed event. The results of this project have the potential to help police officers elicit a greater quantity and quality of information from elderly eyewitnesses and/or victims of crime.

If you could please spare some time, I would appreciate discussing the possibility of approaching members of your staff about filling in a short questionnaire to examine how police perceive and deal with elderly witnesses. I have enclosed a copy of this for your consideration. If you feel that some officers might be interested in volunteering their assistance, I would be very grateful if you would please contact me at the number below so that something can be arranged. Thank-you very much!

Yours,

Allison M. Wright, B.Sc.(hons), M.Sc.
Research Student
University of Kent at Canterbury

phone: 01227 827821
fax: 01227 827030

e-mail: amw9@ukc.ac.uk

Appendix C

Letter sent to Chief Officers who agreed to distribute questionnaires, outlining the method of questionnaire distribution (Study 1).

Date

Address

Dear XXX:

Thank-you very much for your rapid reply to my letter and for expressing an interest in my project!

As we discussed earlier on the phone, I am sending along X questionnaires (with return envelopes) and would be grateful if you could please ask any officer who is willing to participate in this study (regardless of age, sex, rank of office, or level of experience) to complete a questionnaire and post it back to me sometime within the next three weeks.

Thank-you again for being so helpful! If you or your officers have any questions of concerns, please do not hesitate to contact me at your convenience.

Yours,

Allison M. Wright, B.Sc. (hons), M.Sc.
Research Student
University of Kent at Canterbury

Phone: 01227 823428
Fax: 01227 827030

e-mail: amw9@ukc.ac.uk

Appendix D

Content dictionary for scoring open-ended questions from the questionnaire used in Study 1. (Showing open-ended questions and the complete range of officers' responses to each question)

Q5 – Please describe the type of training you have received for interviewing witnesses and/or victims of crime and how valuable you found this to be.

- peace – trained in P.E.A.C.E. process
- vvo – took a "Vulnerable Victim Officer's" course
- soit - received Sexual Offenses Interview Training
- nit - received National Interview Training
- mogp – trained according to the Memorandum of Good Practice
- childr – training involved interviewing children
- invest – mentions that they took an 'investigative interviewing' course or indicates that they were trained to use a Cognitive Interview
- don't score – basic interview training at the time of joining police force

Q7(b) – What generally leads to this (interviewing) delay?

- resourde – lack of resources (e.g. too few officers, no suitable interviewing environments)
- allocde – delay caused by inputting and allocation of crime reports (i.e. paperwork)
- reportde – witness/victim has failed to report the crime immediately
- witnessde – the witness/victim is unavailable (e.g. because of personal commitments, because it is necessary to first make arrangements for witness safety, because s/he is intoxicated and must first become sober)
- crimede – delay depends on the type of crime involved (e.g. interviews for some crimes require extensive preparation)
- otherde – officer provides a response that is not mentioned in any of the above categories (e.g. delay is caused by the fact that an officer has not dealt with the witness' complaint properly)

Q8 – What type of interviewing protocols do you follow when interviewing witnesses/victims of crime?

- prpeace – follow P.E.A.C.E. procedure
- prmogp – follow the Memorandum of Good Practice
- prforce – officer makes a general statement that s/he uses the 'standard' policy, or the policy developed by his/her individual police force
- prcognit – uses 'cognitive techniques' or the Cognitive Interview
- prdepend – procedure differs depending on the witness and the circumstances
- prother – officer provides a response that is not mentioned in any of the above categories (e.g. states that s/he begins by using open-questions, then uses closed questions)

Q13 – Please briefly explain the reasons for your choices (about older adults' reliability and thoroughness)

- no – officer didn't seem to understand the question (or his/her response made little sense)
- variable – response indicates that some older people are mentally sharp, and that others are not as sharp, but this variability has nothing to do with their age (only their own individual personal capacity)
- confuse – older people are more confused than young adults, and are more likely to wander off topic (e.g. hard to keep focused, reminisce too much). Also score if participant says that older people are more likely to tell the interviewer only what s/he wants to hear, and are less confident than young adults.
- physical – older people are less able to perceive an incident in the first place (e.g. due to poor eyesight, hearing)
- detail – older people tend to pay less attention to detail (e.g. poorer at recognizing makes, models, brand-names) and rely more on stereotypes when describing others than actual descriptions (e.g. 'he looked like a druggie')
- forget – response indicates that older people tend to be more forgetful

- cultural – response indicates that older people tend to mistrust the police, or have an attitude that makes certain aspects of the investigation difficult (e.g. don't think it's 'proper' to report certain intimate details, may say little because they are afraid of becoming involved)

- truth – older people are more truthful, don't exaggerate things

- meticul – older witnesses are more meticulous, careful, pay more attention to people (as a result of their increased experience and intelligence)

- remember – older people have better memories than younger ones (i.e. retain more information)

- interview – the information you get depends more on the interviewer, and the questions asked than on the interviewee (if the interview is of a good quality, the witness should always give good information)

Q14 – If not, can you suggest any improvements?

- newprot – generally states that a new protocol should be implemented, but does not give details about it (or states that there is no protocol)

- video – video-interviewing of the older adults should be made more accessible

- time – officers should be allowed to devote more time to interviewing

- training – more training (about interviewing and dealing with specific witness groups, like the elderly) should be provided

- faster – more resources should be available (e.g. more officers), to enable statements to be taken sooner

- support – more victim support and protection is required, should always try to use an interviewer and a setting that are familiar to the witness

Q15 – If not, explain what you do differently

- slow – go at a slower pace, spend more time with witness (e.g. allow them to wander off topic)

- care – use a different attitude, language, and style of rapport (e.g. be more patient, caring, quiet and respectful)

- encourage – use more supportive behaviour than normal (e.g. more eye contact, verbal reassurance and nonverbal support like head nodding)

- depends – techniques used vary according to the specific needs and personality of the individual witness

- other - officer provides a response that is not mentioned in any of the above categories (e.g. interviews an older person the same way as a child, tries to break free recall phase down to make it more manageable, selects a comfortable environment for interview to take place)

Q16 – What are the greatest challenges you face when interviewing an elderly witness?

- attention – attention span of the older witness is very short (older people ramble and wander a lot, hard to keep them focused)

- upset – older people are likely to get upset easily during the interview, and often express fear and confusion

- training – officer does not feel adequately trained to conduct interviews with older witnesses

- memory – older adults have poor memories and are bad at remembering details

- physical – older people's physical problems and disabilities (e.g. hearing, vision, illnesses) can be difficult to accommodate

- communication – have difficulty relating to an older witness (e.g. find it trying to ask questions slowly, repeat questions if they are not understood the first time, and to explain 'modern' terminology)

- time – feels that the greatest challenge is finding enough time to devote to an interview

- other - officer provides a response that is not mentioned in any of the above categories (e.g. interviewer is distressed at the thought of an older person being abused or harmed)

Appendix E
The Mini-Mental State Exam (Folstein et al, 1975).

1) What is the year?
2) What is the season?
3) What is the date?
4) What is the day of the week?
5) What is the month?
6) What (state/county) are we in? ('state' was substituted for 'county')
7) What town/city are we in?
8) What are the names of two main streets nearby?
9) What (room of the house/floor of the building) are we (in/on)?
10) What is the address or name of this place?

11) I am going to name three objects. After I have said them, I want you to repeat them. Remember what they are because I am going to ask you to name them again in a few minutes. Please repeat the 3 items for me. Repeat the answers until the participant learns all objects. (*apple, table, penny*)

12) Spell the word 'WORLD' backwards. (Give one point for each letter being in its correct place)

13) Ask the participant to name the three objects s/he learned in question 11 (give one point for each correct answer)

14) Interviewer points to wristwatch, then asks the participant to name the object.

15) Interviewer points to a pencil, then asks the participant to name it.

16) Ask the participant to repeat the phrase "No ifs, ands or buts" (allow only one trial; if the participant is unable to repeat the entire phrase correctly, do not award a point)

17) Have the participant read and obey the following instruction (written in 24 pt font): "Close your eyes". (award a point if the participant follows the instruction)

18) Ask the participant to follow a three-stage command, and award one point for each instruction that is successfully carried out:

Take the piece of paper in your right hand.
Fold the paper in half with both hands.
Put the paper down on your lap.

19) Ask the participant to write a complete sentence (of his/her choice) on a piece of paper.

20) Enlarge the design drawn below to 1.5cm per side, and ask the participant to copy it (giving one point if all sides and angles are preserved and if the intersecting sides form a quadrangle).

Appendix F

Leaflet and newspaper articles used to recruit participants for Studies 2, 3 and 4.

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Are you aged 19-30, or 60+?

If so, you may be able to help!

As part of my PhD titled Enhancing Memory Retrieval Among Witnesses and Victims of Crime at UKC (under the supervision of Dr. Robyn Holliday), I am examining various interviewing methods that could be used by police officers to help eyewitnesses and/or victims of crime remember more about what they have seen.

- **You will be asked to view a 3min video of a non-violent crime.**
- **After 30mins, you will be given an interview to help you remember as many details about the video as possible.**

The study will take about 1 hour to complete.

Names and any details which could be used to identify specific individuals will not be included in any of the reports produced from this study, made publicly available, or given to any other person. Participation is completely voluntary and you may withdraw from the study at ANY time without giving a reason.

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NEWSPAPER ARTICLE: 'Question of Memory' (appeared in KM Extra, March, 2002)

A research student at Kent University is appealing for volunteers to help with a study into how elderly witnesses and victims of crime can be helped to remember more.

Allison Wright, from the department of psychology at Keynes College, is investigating how memory retrieval can be enhanced using interview methods which could be used by police officers.

The study is part of her PhD degree and she is working under the supervision of Dr. Robyn Holliday.

She said "I am looking for volunteers over the age of 60 and the study will take place over 90 to 120 minutes. Participants will be asked to view a 5 minute video of a non-violent crime and, following a 30-minute break, asked to remember as many details as they can. They will also take part in various short mental tasks".

Anyone interested in helping the study should contact Allison on 01227 827821.

NEWSPAPER ADVERTISEMENT: (appeared in Canterbury Adscene, October, 2001)

Volunteers (aged 19-30 and 75-92) needed for a PhD study about interviewing methods that could be used by police to enhance the memories of elderly eyewitnesses of crime. Participation may take up to 1.5 hours. Volunteers will be asked to watch a short video and after a 30min break will be interviewed about what they have seen. All personal information will be kept strictly confidential. If you are between the ages of 19 and 30 or 75 and 92 and are interested in helping, please contact Allison Wright (University of Kent, Psychology Dept.) on 1227 827821.

Appendix G

Outline of the video used as a stimulus in Studies 2, 3 and 4.

- Hooligans walk across parking lot, looking into car windows
- a girl who is pushing a bicycle walks past and looks at them closely, because their behaviour seems suspicious
- the hooligans are rude to her and act a bit threatening (make comments like "what do you think you're looking at??")
- she rushes away, embarrassed, and they continue to look at cars
- Hooligans notice one car with its window partially unrolled and walk over to it
- one hooligan (H1) walks around the car, the other two (H2 and H3) just stand there watching
- H1 takes a closer look at the car
- People walk past (e.g., lady carrying an umbrella, man with a child), but don't notice anything (while walking past, child drops toy)
- After the people have passed, H1 peers closely into the car windows, then sticks his/her hand in the partially unrolled window and tries to undo lock in order to open the car door
- Owners of the car walk up, don't immediately see hooligans
- Owners notice the hooligans, shouts at them (e.g. "Hey! That's my car! What are you doing?") and hurry over to the car
- Hooligans are startled, H2 and H3 run off, H1 untangles his/her arm from the car and runs in opposite direction, being chased by one of the car owners
- A passer-by sees what's happening, and comes to help

Appendix H

Description of the Enhanced Cognitive, Modified Cognitive and Structured Interviews used in Studies 2, 3 and 4 (Part 1) and the cue sheets used by the interviewer during testing (Part 2).

PART 1 – Description / outline of Enhanced Cognitive, Modified Cognitive and Structured Interviews

Cognitive Interviews

1) Rapport building phase
    a. Talk about neutral issues / events
    b. Rules of the interview explained

2) Free Recall Phase
    a. Context Reinstatement
    b. Report All – ask for free narrative account
    c. Change Order
    d. Change Perspectives *(** omitted in Modified Cognitive Interview)*
    e. Anything Else?

3) Questioning Phase
    a. Only information that was provided in the free recall phase is used as questioning topics
    b. Mental Imagery Instructions
    c. Open, followed by more specific questions
    d. Anything Else?

4) Closure

Structured Interview

1) Rapport building phase
    a. Talk about neutral issues / events
    b. Rules of the interview explained

2) Free Recall Phase
    a. Ask for free narrative account
    b. Anything Else?

3) Questioning Phase
    a. Only information that was provided in the free recall phase is used as questioning topics
    b. Open, followed by more specific questions
    c. Anything Else?

4) Closure

PART 2 - Information on the cue sheets used during interviews

Initial instructions (given before all interviews)

- explain tape recorder and note taking

- Doesn't matter how fast or slow you are, the important thing is that you tell me everything you can, in your own time and at your own pace.

- If you get tired or frustrated/bored, just let me know, and we can take a break. And as I said earlier, if you want to stop doing the study, we can and you don't have to give me any explanations. Do you think you have enough time to spend on the interview so that we won't be rushed?

- I HAVEN'T SEEN THE VIDEO, so I don't know anything about it. Going to work through several steps to try and help you remember all you can about the video you watched earlier. It will be important for you to concentrate, and to try your hardest, but *this isn't a test.*

- If you don't know the answer to something, it's ok to say that you don't know. If you don't hear what I've said, or if you don't understand what I'm asking you to do, please just let me know, and I'll try to explain it more clearly. Similarly, if I misunderstand you, or if I get something that you've said mixed up, please correct me!

- Throughout the interview, I'm going to ask you to please try to tell me as many details as you possibly can about what you saw. Tell me everything, even details that you think might be unimportant – sometimes these memories 'trigger' other memories, which can be helpful.

- Ask if participant is ok with all this and if s/he has any questions.

Cues for Modified and Enhanced Cognitive Interviews:

Context Reinstatement

- Before we start, I'm going to ask you to close your eyes and picture the room where you watched the video.
- What could you see in the room?
- What could you hear?
- What could you smell?
- How were you feeling when you watched the video?

Report All

- please tell me everything you can about the video you watched earlier, even things that you think may not be important
- please give as many details as possible, without leaving anything out, and without guessing about information

Reverse Order:

- going to try something next which sometimes helps people to remember more
- want you to tell me about the last thing that you remember in the video
- what happened before that? (keep asking 'what happened before that?' until participant reaches beginning of film)

(Change Perspective – *omit for Modified Cognitive Interview*)

- going to try one final technique which is thought to help people's memories, although you'll have to be careful not to guess at any of the information you give
- you mentioned a person who noticed the hooligans trying to get into the car, who chased them away…
- I'd like you to please try to go through the event again, but this time, try to put yourself in that person's shoes, and tell me what that person saw, the things that that person would have noticed

Remember Anything Else?

Questioning Phase with Mental Imagery:

- going to have you think about some of the things you mentioned again, and try to construct a more in-depth description
- ask participant to concentrate and to say everything that comes to mind
- may be some questions that you don't know the answer to, but that's fine, no one can be expected to remember everything, it's okay to say that you don't know
- For each image, recreate the environmental and psychological environment, then get the participant to describe the image (e.g. you mentioned a man… try to get a good clear picture of him in your mind, When you have a clear picture of him, tell me everything you can about him, in as much detail as possible)
- If witness leaves certain things out, give further open-ended instructions (e.g. describe his clothing, describe his hair, etc.)
- Before activating the next image, make a clear break to indicate that you will be moving on to something different – to ensure that the participant doesn't simply repeat earlier answers
- Order: ask about things in the order that the participant originally mentioned them (in free recall)

End of Questioning Phase:

- is there anything else that you can remember about what happened?

Cues for Structured Interview:

Free Recall:

- please tell me everything you can about the video you watched earlier
- anything that comes to your mind, as many details about what happened as possible, without guessing

Remember Anything Else?

- when it seems like participant has said all that s/he is going to in his/her free recall, ask if there is anything else s/he can remember

Questioning Phase

- explain that I'll just ask them a few questions about the incident now
    - ask participant to concentrate
    - should try to give as many details as you can
    - may be some questions that you don't know the answer to, but that's fine, no one can be expected to remember everything, it's okay to say that you don't know
- examples of person questions
    - can you tell me everything you can remember about X?
    - what colour was his/her hair? How was it styled?
    - what was s/he wearing?
    - can you remember anything more about his/her face, clothes, whatever?
    - is there anything else you can tell me about X?
- car questions
    - can you describe it? Colour, shape, model, number of doors, license plate?
    - can you tell me anything else about the car?
- background questions
    - can you describe the place where the incident took place?
    - were there any other cars around? If so, describe
    - did you see anything else?
- action questions
    - what did X do after --- ? and after that?
    - Did you hear anyone speaking? If so, what did s/he say?
    - What did X do with the Y?

End of Questioning Phase

- is there anything else that you can remember about what happened?

Appendix I
Participant information sheet and participant consent form.

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"Enhancing Eyewitness Memory"

A) RESEARCHER CONTACT INFORMATION:

If you have any questions or concerns at ANY point during the study, please contact:

Allison M. Wright
Dept. of Psychology
Keynes College
University of Kent at Canterbury
Canterbury, Kent
CT2 9DL
Phone: 01227 82 4299
Fax: 01227 82 7030

B) GOALS OF THE PRESENT STUDY:

The elderly are often thought to have weak memories. As a result, many people assume that older individuals make poor eyewitnesses to crimes.

Although some research *does* suggest that eyewitness accounts of older adults tend to be less accurate and complete than those of younger adults, authors agree that older people *can* still be valuable witnesses to crimes, especially if they are interviewed in an appropriate manner.

Unfortunately, as crime rates continue to rise in society, and as the proportion of elderly people in the population grows, elderly individuals will be increasingly likely to witness criminal activity, and report it to the police. It is therefore important to understand as much as possible about the nature of eyewitness memory in older adults.

The present study will examine various interviewing methods that could be used by police officers to help elderly eyewitnesses and/or victims of crime remember more about what they have seen. This work is being conducted as part of a PhD degree at the University of Kent, under the supervision of Dr. Robyn Holliday (phone 01227823087).

C) PARTICIPATION:

IMPORTANT - Participation is completely voluntary, and you may withdraw from the study at ANY time (even at a later date) without giving a reason, and without suffering any consequences for your decision.

This study will take place over the course of 1 hour.

- Participants will first be asked to view a 3min video of a non-violent crime being committed.
- Next, participants will be asked to complete several short mental tasks, and to complete a questionnaire about their attitudes towards life.
- After a 10 min break, participants will be asked, in an interview, to remember as many details as possible about the crime video they watched earlier (interviews are expected to take about 30minutes to complete).
- Before volunteering, please ensure that you will have enough time to attend the entire session.

D) CONFIDENTIALITY:

Names and any details which could be used to identify specific individuals will not be included in any of the reports produced from this study, made publicly available, or given to any other person. Instead, each participant will be assigned a number that will be used in all subsequent analyses and reports.

E) WITNESS/VICTIM SUPPORT PHONE LINES:

If you, or anyone you know, has witnessed, or been the victim of a crime, and wish to seek counseling, please call one of the following numbers:

Help the Aged's SeniorLine
- open Monday to Friday, 10am to 4pm, 0800 65 00 65

Victim Support
- Canterbury and District, 01227 779090
- Relate, 01227 766094

Similarly, if you are troubled by the events depicted in the video, or about any aspect of the study, please contact a family member or your doctor.

☺ *Thank-you very much for your time!* ☺

"Enhancing Eyewitness Memory"

Doctoral Research Project – Consent Form
University of Kent at Canterbury

Please sign this form in the space provided below if you agree with the following statements:

- I have read and understood the attached Participant Information Sheet.
- I understand that my participation in this study is voluntary, and that I am free to withdraw from this study at any point in time, without giving a reason, and without suffering any consequences for my decision.
- I realize that I am able to contact the researcher (Allison Wright) or her supervisor (Robyn Holliday) at any time, should I have questions or concerns about my involvement in the present study. (Telephone numbers can be found on information sheet)
- I understand that all of my personal details will be kept strictly confidential – this information will not be included in any of the reports produced as an outcome of this study, will not be made publicly available, and will not be given to any other person.

NAME:

SIGNATURE:

DATE:

Appendix J

Example of a transcribed Structured Interview.

*** opening instructions have been omitted, as these always followed the cue sheet found in Appendix H*

A: ...okay, so now if you could please tell me everything you can about the video you watched earlier... so just as many details about what happened as possible, without guessing at anything

P: um, it was in a parking lot. There was 3 people – 2 men and one girl, one woman. Uh, I would say the man was about 6 feet 1 inches or something like that. The uh, second, oh! And he had a leather jacket on, and blue jeans, and no hat. The 2nd one was shorter than him, maybe 5'11". He had um, a dark anorak, black or navy anorak on, and a black woolen hat. Not covering his face or anything. And the girl, mm, she was kind of in the back of the picture all of the time, but she did come to the fore and she had on a leather jacket and a hat, I think it was, I think it had a peak on, but I'm not sure, it wasn't very clear on the video. And they were trying car doors and there was, the one that was in the foreground, that they paid attention to was a red car. Don't know the make, I don't know cars. Uh, but they were trying them all and during all this there was various people pass by. There was a lady um, she was carrying an umbrella. Think she had a skirt on but I'm not sure. Then a man passed by with a little boy and they bent down on the pavement to do something, but the father was obviously anxious about these people and he got his son up again and they went off. And then there was man came out to his, came out to one of the cars in the background and he was carrying a briefcase I think it was and he opened his car, unlocked his car and put the briefcase in, locked it again, and left. There was somebody on the left of the cars, there was a man on the left, doing something in the trunk of a car, not sure what, can't remember what he was wearing, and a young, a couple, wandered by, can't remember what they were wearing either. And then um, a man and woman came to get into the car that they were trying to get into and they ran off. And the woman was quite upset and shreiking. And um, the man she was with ran after them, but and then a lady came by came by, a youngish lady, tall and slim. She had a long skirt on and a blouse, some kind of over-blouse thing, and a hat. Like a, a bit like, not straw, but a panama shaped hat. And um, I can't honestly remember how the video ended (laughs) but the man came back, the man came back to the car and um, that's about all I can remember. Somebody else that passed, there was somebody else that passed by... I think it was a man and he, all I remember about him was that he was carrying an umbrella as well... was there anybody else went by? Was about 4 red cars I noticed. Um a blue one, it was a blue one that they were trying to, that they were mostly concentrating on. and I think that's about it

A: and are there any other details about it that come to mind?

P: can't think of any, can't tell you what the surroundings were, I was concentrating on the people. Um. Not, if there was anybody else in it, I can't remember.

A: okay. Um, so what we'll do now, is I'll just go back and ask you some questions about some of the things that you mentioned

P: yeah

A: you said that it was a parking lot, would you be able to maybe describe how the parking lot itself was set up?

P: yeah, there was about, let me see, there was about 6 parking places and and then that was on the right and then, I don't know whether the man that was looking in the trunk was in the parking place, but there was one car on the left. And I dunno whether that was in the parking lot. Uh, what I do know about the parking lot, is when I can't exactly say I know what was round it. There wasn't houses, there was trees. And that's about it. It was paved

A: um and you also mentioned that you saw 2 men and a lady who were sort of wandering around the cars

P: yes yeah.

A: um could you maybe start by describing the woman

P: okay., uh she was in the background quite a lot, but she did come to the front. And she had on pants and a leather jacket and a hat... ah, what's the best way to describe that. it was one of those, it had a peak on and it was kind of flat. It wasn't like a cap, when I say it was flat it was... um, sticking up about 2 inches as though it had a band. Who wears them? Who have I seen wearing them? Like sea men or people usually from Europe wear them

A: okay, did you notice maybe her height roughly

P: yeah, she was shorter than the, both men. And I would say she was about 5 feet 6 or something like that. average height. She wasn't sort, she wasn't tall

A: could you describe her body build at all

P: her body build was average, uh, on the stocky side a bit

A; um and were you able to notice any of her hair from under her hat

P: no I didn't notice any hair, no

A: and how about any facial features or anything about her face

P: no I can't remember anything about her face, nothing unusual

A: and you mentioned that she was wearing pants and a leather jacket. Did you notice any colours

P: yeah the pants were a funny colour like, they looked reddy orange. Red-orange.

A: and you also, oh her age, did you get an idea of how old she seemed to be?

P: ohh, I would say late 20s, but I'm not very good at ages either

A: that's okay, (both laugh) with some people, it's really hard. And you mentioned that there was a taller one who was about 6feet, wearing a jacket

P; yeah

A: without a hat. Could you tell me any more about him?

P: with jeans, without a hat. And he had no facial hair or anything like that, he was clean shaven.

A: did you notice his age

P: I would say, early 30s.

A: and how about maybe his body build

P: tall. Uh. medium build. Not fat, not thin, just medium

A; and maybe the colour of his hair.

P: couldn't really tell from the video, but dark rather than fair

A: and is there anything else about him that comes to mind

P: nope. Didn't notice the shoes he had on. didn't notice if they were shoes or sneakers, or no. short hair

A: mm hm? And how about the last one, who was a bit shorter, wearing the dark anorak and the wool hat

P: uh, he had the, it wasn't a leather anorak. Uh, and he had a, it was a black hat. just a normal toque type that was rolled up. and I would say he was about, 5'10", and clean shaven again. I paid more attention to the man in the foreground. Rather than him. They, the girl and him, the woman and him came forward, sort of toward the end, but the main picture was the man, the taller man.

A: and did you notice the age of this, the shorter man

P: Oh...somewhere between 25 (laughs) and 30.

A: and um, were you able to see any of his hair at all under the hat or

P: no I don't recall any, seeing any. It was down over his ears, his hat

A: and is there anything else about him that comes to mind

P: not really, just that he wasn't the main one

A: and you also mentioned that there was a blue car that they were concentrating on

P: mm

A: could you maybe, you said that you weren't sure of the make,

P: I'm not sure, I don't know makes of cars

A: would you be able to just try describing the car

P: Uh, medium size, uh, squarish. Don't know how many doors it had. Whether it was a 2-door or a 4-door.

A: were you able to see any license plates or anything

P: no, no I didn't see any license plates because they were turned the opposite direction. And even the man in the one that was looking in the car, where he was looking in the trunk, he was hiding the registration number, you couldn't see it

A: so when you say that they were in the opposite direction, how do you mean

P: uh, I mean there was, thy were parked sideways to me, none of them was parked facing on to the registration numbers

A: and you also mentioned that there was a lady who walked past, a passer by, wearing a skirt

P: I think she ahd a skirt and just a sweater. And she was carrying an umbrella. Can't remember whether her hair was short or long. I think more short and curly than straight.

A: did you notice the colour of that

P: no just you know, not blonde. Just brown. It wasn't brown, but kind of a lighter colour

A: and did you notice maybe the colour of the clothing that she was wearing.

P: nothing other than the sk- if it was a skirt, it was lighter than the sweater. Like a beige-y skirt.

A: and did you maybe notice her age

P: I would say she was late 40s.

A: and how about her height

P: oh, I would say about average height, about 5 feet 5, something like that.

A: and was there anything about her body build

P: um, just a little bit heavier than normal. More tendency to be heavy than a light weight.

A: and is there anything else about her that comes to mind

P: um, no not really.

A: and you also mentioned that there was a man and a boy, who bent down for some reason and kept going

P: the man, I would say the man was in his 40s, uh... same thing. Non-descript, you know. and I would say the little boy was about 7. And I don't know, I don't think they bent down to pick something up, I think the little boy had something in his hand ad was putting it down but the man picked it up again. He was obviously anxious at these people hanging around and and they went off fairly quickly. I think the little boy was fairish. Not dark hair. Can't remember what either of them were wearing.

A: did you notice any colours or anything they might have had on

P: no, not really, they must've been blacks, beiges, no not blacks, beigey, light colours.

A: and how about maybe the- the man's height?

P: um, I would say 5' 10".

A: and what his body build was like

P: body build... medium

A: by body build you mean

P: I mean uh, not chunky, not fat, just ordinary

A: okay. And did you notice anything about what the boy had that he was

P: no I couldn't see it clearly. I dunno what it was. And then when they went away, you know, I didn't see it when they left, and I noticed that there was something lying on the ground, but I don't know what it was, it could have been a piece of paper or something off the kid's toy or whatever he put down.

A: and did you notice the direction that they were going in

P: uh, they were going left.

A: and you also mentioned a man that was sort of in the background and he put a briefcase or something

P: yes. And I think he was dressed in a suit I think. And he came and put it in the car, and then locked the car and then left. And it was unusual. I didn't think that he was paying much attention to what was going on around him with these people.

A: did you notice his height maybe

P: I would say he was about 5' 11" didn't have a hat. Medium coloured hair.

A: by that could you

P: medium coloured hair. Not blonde, not dark, um... if it was in colour I'd say brownish, brown hair.

A: um did you notice maybe what his age would have been approximately

P: late 40s, early 50s.

A: maybe the car that he was

P: just that it was a red one

A: did you notice anything else about it

P: no, but it was a little bit bigger than the blue one the people were after.

A: and whereabouts, you said that it was sort of in the background

P: yeah. it was parked the same way as the blue one. So facing to the right. And there was one car, I think in between, I'm not sure about it but I there was one car in between the blue one and the one the man was putting his briefcase in.

A: and you also mentioned that there was a man who came by, just sort of passed by with an umbrella

P: and that's all I can remember about him (laughs!) don't remember how tall he was, what he was wearing. It was the umbrella that hit me. Because I thought "oh! He's carrying an umbrella as well as the woman"

A: did you maybe get any impression of his age

P: no not really

A: colours that he was wearing

P: no, just, I think dark colours, but I'm not sure. And he was slim. And tallish, but I wouldn't know what height exactly.

A: do you know the direction that he went in

P: I think he was traveling from the bottom to the top of the picture

A: and you also mentioned that there was a man on the left in the trunk of his car

P: trunk of his car for quite a while. He was doing something in the trunk of his car.

A: can you maybe tell me about him?

P: uh. light coloured clothes, not sure what colour. Long pants, I can't remember whether he had a jacket on or not. Don't know what he was doing in the trunk. Didn't see the number because he was obscuring it. Uh about 5 and a half to 6 feet tall. And, brownish hair. None of them had any features where you thought, "Oh good lord! Look at that!" (both laugh)

A: this man in the trunk, did you maybe notice what his age would be?

P: no he had his back to me

A: could you maybe describe the car he was at

P: can't even tell you the colour of it.

A: okay that's fair enough

P: don't know (laughs)

A: and you also mentioned that there was another couple that just sort of wandered past

P: yeah there was a couple that came from the top of the picture to the bottom. There seemed to be a bit of a path or a break in the cars that they were coming down. Middle aged. Maybe a bit younger than middle aged. Can't remember what either of them were wearing.

A: any colours

P: no. didn't know whether they had coats on or not. Can't remember, I just glanced at them walking by. On the left hand side of the picture. No that's all I can remember about them.

A: maybe their body build

P: um... medium body build. The man a bit taller than the woman. Not much about them. I was really concentrating on the people that were trying to break in the cars, to see if they got in or not (laughs).

A: did they get in

P: no they didn't they were scared off before they got in.

A: and you also mentioned that there was a man and a woman who came to the car and the woman was very upset

P: yep. Yes. And he, the man chased, went after them a bit, chased them away. and a young woman, tall and slim. I would say maybe 5'11". Oh do you want to concentrate on the couple first?

A: it's whatever you like

P: um, she was short and stocky, I would say, 5 foot 4, and stockily built and not sure what she was wearing, can't remember. And the man was um, I think he had light coloured pants, like beige or something. And a jacket but I'm not sure what the jacket was. Did I tell you how tall I thought he was

A: mm

P: he was about 5 feet 10. And the young woman that came to help her was tall and slim. She had a long, a long dark skirt on with a split up and sandals. A blouse. And a hat that was like a panama shape it was felt or something, it wasn't straw. And she came in from the right. And that's about all I can remember. oh she was concerned about if they'd taken anything. But they hadn't got in so she was relieved. That they hadn't been able to get into the car. and then I can't remember. I dunno whether it just blacked out there or went their separate ways or what.

A: so the lady who came up, who was taller and slim

P: was aged about I would say in the 20s

A: and did you notice any other colours of the clothes. You said there was a dark black skirt with

P: with a a split up the side and the blouse was light coloured but what colour I don't know.

A: um, and maybe, the man who kind of came to the car. and sort of chased after the people at the end

P: mm

A; can you tell me any more about him

P: I would say he was 45-50

A: mm.... And maybe his body build

P: stocky. But not fat. Just well-built

A: and was there anything about his hair

P: no. I dunno where they picked all these people from, but they were all pretty much just ordinary people (laughs) that wouldn't stand out in a crowd.

A: and how about the lady he was with?

P: she had short hair.

A: maybe the colour of that

P: it was just brown. I think she might have had glasses on, but I'm not sure. Not sure at all about that. That just popped into my head there.

A: and maybe her age

P: oh I would say, mid 40s. I'm not very good at ages

A: and did you notice where the 2 people came from

P: they came from the left of the picture. Where there was this, some kind of space between the cars, like a path. Or just part of the parking lot that they didn't park on.

A: and did you happen to notice where the people who were trying to get in the car, where they went? Which direction?

P: I think they, scattered a bit. But in general, they tended to go down to the left hand the left hand corner of the picture. And when the man chased them, you didn't actually see him chasing after them. He just disappeared off the screen into the direction that they were going. I think the girl might have gone up towards the left hand side of the picture, not sure.

A: And is there anything else you can tell me about the video? Anything that comes to mind?

P: no... no can't think of anything.

Appendix K

Explicit instructions for coding interview transcripts.

A) Detail Types:

- Action details include any information about what someone was doing
  - he was a lookout
  - she was upset
  - she was screaming

- Person details include any information about
  - what the actors looked like: e.g., long (1-P) black (1-P) hair (1-P), taller than the girl (only score as 1-P)
  - what the actors were wearing (including colours): e.g., she was wearing a mauve (1-P) jacket (1-P), white clothes (1-P)
  - score (1-P) anytime a new actor is mentioned
  - score 'somebody whose car it was' or 'the car owner' as (1-P)

- Object details include inanimate things that people were
  - carrying: e.g., umbrellas, shopping bags,
  - using: e.g., bicycle, wire to open car lock
  - looking at: e.g., cars
  - also includes any descriptions of the objects themselves (e.g., number of doors a car had, the colour of the car)

- Surrounding details include information about
  - the background/setting: e.g., it was a car park, there were trees, it was a sunny day, there were trees in the back
  - sounds that were heard: e.g. glass breaking, heard screams, video didn't have any sound
  - directions that people came from or went to: e.g., walked (1-A) in front of the cars (1-S), came from (1-A) the left (1-S)
  - what the participant's view/the camera angles would have allowed him/her to see: e.g., their faces were too far away to see clearly
  - don't score 'couldn't see the numbers on the back of car' if they have already said that the car was sideways on

B) Determining Level of Detail Accuracy:

- Correct details
  - participant mentions details that are present in the video
  - e.g., says that there is a grey, 2-door car, when in fact there is such a car

- Incorrect details
  - participant mentions a detail that is discrepant from the film
  - e.g., says that someone is wearing a dress when they are actually wearing trousers, says that the girl with the bike is riding it, when in

fact she is pushing it, says that a jumper is pink when it is actually blue

- Confabulated details
  - participant mentions a detail that was not present in the video, or that did not happen
  - e.g., says that the hooligans smashed the car window, says that it was raining, says that someone was wearing a hat when they weren't, says that there is an extra character (e.g., police officer) present

C) Vague or subjective responses:

- If the participant is too vague about a detail, don't score it. Some examples of vagueness:
  - he was average height
  - they did something (but accept 'he was doing things' for the man in the boot of his car)
  - something happened
  - if participant says that someone was wearing 'light' or 'dark' clothing, still score this as (1-P)
  - if the participant says that there was a "small child", score it as (1-P) – for identifying 'child'. If, on the other hand, the participant says that s/he saw a "little boy", score it as (2-P) – one point is for identifying 'boy' and another is for identifying that the boy was 'little' (i.e., a child)

- If the participant says subjective things, or if they infer things (about actors' motivation, etc) don't score. For example:
  - she was 'pretty' or 'ugly'; he had 'nice' shoes
  - if participant says something about the size of the car park, don't score it (since several participants said that it was large and many said that it was small)
  - s/he *must have been* coming back from shopping (if a participant said this, the interviewer would have asked what gave him/her the impression that the character was coming back from shopping – if the participant then said something like 'they were coming from a store' or 'they were carrying shopping bags' this information, but not the 'must have been...' statement would be scored)

D) Scoring Uncertain Responses:

- If the participant seems unsure about a detail, score it separately from all other statements (determine whether each item is an Action, Person, Object or Surrounding detail and determine if it is correct, incorrect, or confabulated, as above). Some examples of Uncertain Responses:
  - 'I believe they smashed the window to get in, I'm not sure though'

- 'and maybe... I'm just wondering whether her hair was blonde... I can't really remember. I think I'd better leave well enough alone and not guess'
- 'and I think he had a denim jacket, but I'm not going to say for absolute certain. Um I think so, but that's not necessarily true'
- 'I got the impression it was round, symmetrical... but I'm grasping at straws'
- sometimes people have a tendency to preface their remarks with 'I think', even though they are sure of the detail they are talking about (score things that have an 'I think' attached normally, unless the participant indicates that s/he is not confident about the statement s/he makes – if it seems unclear from the transcript, go back to the tape and listen to participant's tone of voice)
- don't score uncertain statements that have an 'either/or' in them (e.g., i'm not sure, her trousers could have been either red or green')
- NOTE: if participant says that s/he isn't sure if the hooligan with the red trousers is a boy or a girl (or if s/he says that it could be either), score this as correct (since it is fairly difficult to determine this person's gender, given their costume). However, if participant says that there are 3 male hooligans, rather than 2 men and one lady, score it as (2-P) correct and (1-P) incorrect

E) Additional information:

- if a participant gets 2 characters confused and mixes up the details about each one, choose the option that gives the participant the most correct details

- the number of people/cars
    - if participant says that there are 4 youths, rather than 3, score it as (3-P) correct and (1-P) confabulated
    - if participant says that there are 'several people', score it as (1-P)
    - if they say there are 'several cars' there, score it as (1-O)
    - if they say that there were 2 or 3 people (e.g., hooligans), score it as the lowest number in the range (so in this case, 2-P)

- When the participant talks about the same person several times during the course of the interview
    - first time they mention a man with a black leather jacket, score as (4-P), afterwards, they may use this as his 'name' (e.g., 'the man with the black leather jacket walked past....') so thereafter always just score it as (1-P)

Appendix L
The coding template used in Studies 2, 3 and 4.

Characters in the video:

- Lady with Umbrella (1-P)
  - short/chin-length (1-P), wavy (1-P) brown / light brown (1-P) hair
  - Caucasian (1-P), female (1-P)
  - glasses (1-P)
  - wearing a red (1-P) sleeveless (1-P) top/blouse that is tucked into (1-P) blue jeans (1-P)
  - belt (1-P)
  - watch/bracelet (1-P) on right arm (1-P)
  - black (1-P) bag (1-P) slung over left (1-P) shoulder (1-P), bag rests on right hip (1-P) – i.e. she is wearing it diagonally across body
  - umbrella (1-O) in left hand (1-P) that is green/black (1-O)
  - aged 40-50 (1-P)
  - height 5 ft 5 to 7 (1-P)

- Girl with Bike (1-P)
  - her bike (1-O): green (1-O), boy's (1-O) mountain (1-O) bike
  - Caucasian (1-P) female (1-P)
  - in 20s (1-P)
  - glasses (1-P)
  - shoulder length (1-P) straight (1-P) dark brown/brown (1-P) hair with fringe (1-P), can't see her ears/hair worn loose/not pulled back (1-P)
  - wearing a black (1-P) sleeveless (1-P) top with rounded neckline (1-P)
  - long (1-P) dark brown/brown (1-P) skirt (1-P) with slit (1-P)
  - shoes are tan coloured (1-P) and flat (1-P), no socks/stockings (1-P)
  - black (1-P) bag (1-P) over left shoulder (1-P), has a white flash on it (1-P)
  - 5 ft 7 to 9 (1-P)

- Man with Child (1-P)
  - male (1-P)
  - dark skinned/Indian (1-P)
  - short (1-P) black (1-P) hair that is greying (1-P)
  - yellow (1-O) umbrella (1-O) in left hand (1-P)
  - jeans (1-P)
  - dark shoes (1-P)
  - dark coloured (1-P) fleecy/cloth (1-P) jacket (1-P) that goes just below waist (1-P), jacket is open (1-P)
  - stocky (1-P)
  - aged 40 to 50 (1-P)
  - 5 ft 5 to 8 (1-P)

- Child (1-P)
  - height: up to father's elbow (1-P)
  - male (1-P)
  - dark skinned/Indian (1-P)

- short (1-P) black (1-P) hair
- aged 5 to 10 (1-P)
- white (1-P) t-shirt/short sleeved (1-P) shirt with logo/writing on it (1-P)
- dark (1-P) trousers (1-P)
- light/white (1-P) trainers (1-P)
- object (1-O) in left hand (1-P)

- Person who puts rubbish in bin (1-P)
  - Caucasian (1-P)
  - male (1-P)
  - school (1-P) bag (1-P)
  - black (1-P) t-shirt/short sleeved (1-P) shirt with writing/design on front (1-P)
  - dark (1-P) trousers (1-P)
  - short (1-P) brown (1-P) hair
  - aged 20 to 30 (1-P)

- Station wagon owner (1-P)
  - short (1-P) blonde/grey (1-P) hair
  - Caucasian (1-P) male (1-P)
  - dark (1-P) sports (1-P) jacket (1-P)
  - light coloured (1-P) shirt
  - grey/tan (1-P) trousers (1-P)
  - white badge/name badge (1-P) on left lapel (1-P)
  - carrying something (1-O) in left hand (1-P)
  - thin/not plump (1-P)
  - aged 50 to 60 (1-P)

- Man in boot of car (1-P)
  - man (1-P), Caucasian (1-P)
  - dark (1-P) top (1-P)
  - tan/beige (1-P) trousers (1-P)
  - dark shoes (1-P)
  - aged 30 to 45 (1-P)
  - stocky (1-P)
  - dark (1-P) short (1-P) hair

- Car Owner (Lady) (1-P)
  - purple (1-P) ¾ length (1-P) jacket (1-P)
  - light coloured/white (1-P) blouse (1-P)
  - black (1-P) trousers (1-P)
  - black (1-P) bag (1-P) on right shoulder (1-P), so that bag sits on left hip– i.e., bag is diagonal across body (1-P), bag had several pockets (1-P)
  - black shoes (1-P)
  - short (1-P) light brown/reddish (1-P) hair with fringe (1-P)
  - no hat (1-P)
  - female (1-P), Caucasian (1-P)
  - sunglasses (1-P, 1-P)
  - about 5 ft 3 to 5 (1-P)
  - aged 40 to 50 (1-P)
  - plumpish body build (1-P)

- Car Owner (Man) (1-P)
  - man (1-P), Caucasian (1-P)
  - about the same height as Owner Lady (1-P)
  - white (1-P) short-sleeved (1-P) shirt with collar (1-P), tucked into (1-P) beige/tan (1-P) trousers (1-P)
  - glasses (1-P)
  - light brown/brown (1-P) hair, moustache (1-P), no hat (1-P)
  - slim (1-P)
  - belt (1-P)
  - trainers (1-P)
  - aged 40 to 50 (1-P)

- Lady who helped (Fiona) (1-P)
  - light blue/white/cream (1-P) straw/sun (1-P) hat (1-P) with a rim all the way round it (1-P)
  - female (1-P) Caucasian (1-P)
  - slim (1-P)
  - taller them Owner Lady and Owner Man, or 5 ft 7 to 5 ft 9 (1-P)
  - long (1-P) straight (1-P) blonde (1-P) hair
  - blue (1-P) shirt with long sleeves, like a light a cardigan (1-P)
  - long (1-P) black (1-P) skirt (1-P)
  - black (1-P) sandals (1-P)
  - sunglasses (1-P, 1-P)
  - aged 25 to 35 (1-P)

- Hooligan 1 – Graham (1-P)
  - shortest of the hooligans/ 5 ft 6 to 5 ft 8 (1-P)
  - male (1-P) Caucasian (1-P)
    black/dark blue (1-P) woolen (1-P) hat (1-P) with white logo on front (1-P), not pulled way down over face (1-P)
  - dark/blue (1-P) jacket (1-P) that goes to waist (1-P), not leather/denim-like (1-P)
  - sunglasses (1-P, 1-P)
  - unshaven (1-P) – but score 'beard' as incorrect because it is definitely not a full beard
  - later in video, can see that he has a blue (1-P) shirt like a t-shirt on under jacket and is wearing dark blue jeans (1-P)
  - lean/slim (1-P)
  - aged 20-30 (1-P)

- Hooligan 2 Sue – (1-P)
  - girl (1-P; but because it's difficult to tell that she's a girl because of her costume, score as correct if the participant says that they thought it *might* be a girl at any point in the interview)
  - black (1-P) floppy (1-P) 70's style (1-P) hat (1-P) with peak (1-P)
  - height 5 ft 6 to 8 (1-P)
  - Caucasian (1-P)
  - black (1-P) leather (1-P) jacket (1-P) with belt (1-P), ¾ length (1-P), is not done up (1-P)

- red (1-P) trousers/jeans (1-P)
- black shoes (1-P)
- blue/dark (1-P) shirt
- late 20s to early 30s (1-P)
- slim (1-P)

- Hooligan 3 James – (1-P)
  - taller than other hooligans, about 6 ft (1-P)
  - hair is short (1-P) and dark brown/brown/black (1-P)
  - male (1-P) Caucasian (1-P)
  - black (1-P) leather (1-P) jacket (1-P) that is open (1-P)
  - white (1-P) shirt with collar (1-P)
  - jeans (1-P)
  - black/brown belt (1-P)
  - sunglasses (1-P, 1-P)
  - side burns (1-P)
  - shoes are dark brown/black (1-P) and have a bit of a heel (1-P)
  - slim/well-built/muscular (1-P)
  - aged 25 to 35 (1-P)
  - no hat (1-P)
  - clean shaven (1-P)

Setting and car descriptions:

- parking lot (1-S)
  - white lines for parking spaces (1-S)
  - not square (1-S)
  - were just looking at the end/ a portion of it (1-S)
  - clean (1-S)
  - tar mac/pavement (1-S)
  - trees/bushes (1-S) around edges (1-S)
  - red maple (1-S) tree (1-S) in front of blue car (1-S)
  - seems to be parking lot at the university (1-S)
  - no buildings visible (1-S)
  - didn't appear to be in a city (1-S)
  - no animals (1-S)
  - bright day, no rain (1-S)
  - white curb visible (1-S), no grass verge (1-S), not a road (1-S)
  - 2 rows of cars (2-S), another row to the far left (1-S)
  - no parking lot attendant (1-P)
  - two lamp posts (1-S, 1-S) and garbage can (1-S)

- camera angle
  - people were too far away to see facial features clearly (1-S)
  - camera angle constant/concentrated on one row of cars (1-S)

- no lorries present (1-S)

- no cars (1-O) came (1-A) or drove away (1-A)

- all cars facing to the right (1-S)

- maroon (1-O) car (1-O)
  - in foreground (1-S), to the right (1-S)
  - 4 door (1-O)
  - like a Vauxhall (1-O)
  - not metallic/shiny red (1-O)
  - silver hubcaps (1-O)
  - empty space to it's right (1-S)

- on far side of the red car (1-S) is a gold/cream/white (1-O) car (1-O)
  - barely visible (1-S)
  - sedan-like (1-O)

- on far side of gold car (1-S) is another car (1-O)
  - barely visible (1-S)

- in second row of cars: silver/blue/light blue (1-O) car (1-O)
  - closest to camera (1-S)
  - small (1-O) hatchback (1-O)
  - 2 door (1-O)
  - 4 seater (1-O)
  - Puegoet 106 (3-O)
  - is sort of on it's own (1-S), empty space (1-S) on the right (1-S)
  - fairly new and clean (1-O)
  - nothing is visible in windows like coats, etc. (1-O)
  - door handles are vertical not horizontal (1-O)

- on far side of blue car (1-S) is a red (1-O) car (1-O)
  - empty space (1-S) on the far side of red car (1-S)

- maroon (1-O) car/station wagon/little van (1-O)
  - 4 doors (1-O)
  - is on the far side of the red car mentioned above (1-S)

- red (1-O) truck (1-O)
  - far side of maroon vehicle (1-S)
  - facing left (1-S)

- dark green/black (1-O) car (1-O)
  - is on the other side of road to the left (1-S)
  - only car in the row (1-O)
  - car facing left (1-S)
  - has boot up (1-O) for the last part of film (1-O)
  - 4 door (1-O)

- roadways
  - pathway/road (1-S) to the right (1-S), runs perpendicular to the front of cars (1-S)

- pathway/road (1-S) in front of video camera (1-S), runs parallel to the side of cars (1-S)
- pathway/road (1-S) curves around right (1-S) passing behind the cars in 2nd row (1-S)
- pathway/road (1-S) turns a corner to the left (1-S)
- more parking spaces around corner/behind (1-S)

- other stuff
  - could tell that video was enacted, not real life (1-S)
  - couldn't see number plates of cars because they were side-on (1-S)
  - cars were parked quite close to one another (1-S)
  - not much sound/conversation (1-S)

Action Sequences (in detail) and Dialogue:

- three hooligans/car thieves (1-P) walk (1-A) towards the camera (1-S)
  - are on the right side of screen (1-S)
  - visible immediately when video starts (1-S)
  - James is on the far right (1-S)
  - Graham is in the middle (1-S)
  - Sue is on the left (1-S)

- Sue (1-P) walks over to (1-A) the far side of the gold car (1-S), but can only see her head/she's obscured by gold car (1-S)

- Graham (1-P) looks at (1-A) license plate/back of (1-O) gold car (1-O)
  - he (1-P) walks (1-A) the near side of gold car (1-S)
  - he (1-P) looks in (1-A) window (1-O)
  - he (1-P) moves around to (1-A) the back of car (1-S)

- James (1-P) goes to (1-A) the far side of maroon car (1-S)
  - he (1-P) tries (1-A) the door (1-O)

- Graham (1-P) leaves the screen (1-A) to the left (1-S)
  - James (1-P) follows (1-A)
  - James (1-P) walks under red maple tree (1-A)
  - he (1-P) has to duck his head (1-A)

- Graham (1-P) comes back on screen (1-A)

- Sue (1-P) walks to (1-A) the red car (1-O)
  - she (1-P) proceeds to check it out (1-A)

- Graham (1-P) tries (1-A) the back of red car (1-O)

- Graham and James (1-P) walk around (1-A) blue car (1-O)
  - Graham (1-P) goes off screen again (1-A)
  - he (1-P) comes back shortly (1-A)

- James (1-P) standing on the near side of blue car (1-S) turns his back to the camera (1-S)
  - he (1-P) tries (1-A) door handle of blue car (1-O)

- Lady (1-P) walks past (1-A)
  - from left to right (1-S) in foreground (1-S)
  - she (1-P) looks at (1-A) the hooligans (1-P)
  - she (1-P) doesn't hesitate/keeps going (1-A)

- Graham and Sue (1-P) leave the screen (1-A) to the right (1-S)

- James (1-P) moves to (1-A) back of blue car (1-S)
  - he (1-P) touches it (1-A) with right hand (1-P)
  - he (1-P) continues walking around (1-A) car in a clockwise direction (1-S)

- Sue (1-P) comes on screen (1-A) from the right (1-S) and she (1-P) walks to (1-A) red car again (1-O)
  - James (1-P) joins her (1-A)

- Girl (1-P) walks on screen (1-A) from right to left (1-S)
  - she (1-P) is pushing (1-A) a bike (1-O)
  - mostly just see her back (1-S)
  - no hand signals (1-A)
  - she (1-P) doesn't stop (1-A)

- James (1-P) turns around (1-A)
  - he (1-P) shouts (1-A) at her (1-P) "what are you (1-P) looking at (1-A)"
  - he (1-P) raises an arm (1-A)
  - Girl (1-P) ducks her head (1-A), she (1-P) sort of looks (1-A) at him (1-P) and she follows the parking lot road (1-S) until she disappears around corner (1-S)

- James and Sue (1-P) watch (1-A) Girl (1-P) leave then they (1-P) walk around (1-A) blue car again (1-O)
  - James (1-P) touches (1-A) it's boot (1-O)

- Graham (1-P) re-enters (1-A) from the right (1-S)
  - he (1-P) walks around (1-A) red car (1-O)
  - Sue and James (1-P) are inspecting (1-A) the boot of maroon car (1-O)

- Man and son (1-P) walk past (1-A) camera from right to left (1-S)
  - they (1-P) seem to be talking (1-A)
  - before they are flush with the bonnet of the blue car (1-S), son (1-P) drops something (1-A)
  - both (1-P) crouch down (1-A) with their backs to camera (1-S) to pick it up (1-A)
  - they (1-P) get up (1-A)
  - they (1-P) walk away (1-A)
  - son (1-P) looks at (1-A) camera as he's standing (1-A)
  - not rushing/son kept up with Man (1-A)

- they (1-P) didn't go over to (1-A) the cars (1-O), were in the foreground (1-S)
- he (1-P) didn't seem to notice (1-A) them (1-P)
- boy (1-P) was on far side (1-S), he (1-P) was holding (1-A) Man's (1-P) right (1-P) hand (1-P)

- Graham (1-P) goes to (1-A) blue car (1-O)
  - he (1-P) moves off screen (1-A)

- Bin person (1-P) walks on (1-A) from around the corner (1-S) (i.e. from the left, where Girl exited)
  - he (1-P) throws (1-A) some rubbish in the bin (1-A)
  - he (1-P) walks off (1-A) to the right (1-S)
  - is in the background (1-S)
  - he (1-P) didn't notice (1-A) them (1-P)

- Sue and James (1-P) move to (1-A) blue car (1-O)
  - James (1-P) kicks (1-A) tire (1-O)
  - he (1-P) throws up arms (1-A)

- Graham (1-P) enters (1-A) from left (1-S)
  - he (1-P) adjusts (1-A) woolly hat (1-P)
  - he (1-P) walks up to (1-A) driver's (1-O) door (1-O) of blue car (1-O)
  - he (1-P) walks away (1-A)

- can see Man in Boot in his boot
  - he (1-P) doesn't notice (1-A) them (1-P)
  - he's (1-P) doing things (1-A)

- Sue (1-P) tries (1-A) blue car (1-O) door (1-O)

- station wagon owner (1-P) walks to (1-A) the maroon station wagon (1-O)
  - comes from the left of screen, near camera (1-S)
  - he (1-P) opens the door (1-A)
  - he (1-P) puts something inside (1-A)
  - he (1-P) closes door (1-A)
  - he (1-P) makes sure door is locked (1-A)
  - he (1-P) walks back (1-A) to where he came from (1-S)

- Sue and James (1-P) stand around (1-A) blue car (1-O)
  - one is on right (1-S), one is on left (1-S) of it
  - Graham (1-P) rolls up (1-A) sleeve (1-P), he (1-P) puts (1-A) left (1-P) arm (1-P) in window (1-O)
  - James (1-P) leans on (1-A) car (1-O)

- Owner Lady and Owner Man (1-P) walk in (1-A) towards the camera (1-S) from around corner (1-S)
  - Owner Man is a bit behind Owner Lady (1-S)
  - they (1-P) break into a run (1-A) when they (1-P) see the hooligans (1-P) at their car (1-O)

- Owner Lady (1-P) is screaming (1-A), she (1-P) has her hands (1-P) up to (1-A) her face (1-P)
- Owner man (1-P) shouts (1-A) "oi! Get away from (1-A) our car (1-O)"
- he (1-P) didn't cry (1-A)
- hooligans (1-P) see (1-A) owners (1-P), hooligans (1-P) run (1-A)

• Sue and James run off screen to the right (1-S, 1-S), Graham runs off left (1-S)

• Owner man (1-P) chases (1-A) Graham (1-P)
  - Owner Lady (1-P) goes to (1-A) driver's door (1-O)

• Fiona (1-P) enters from (1-A) the right (1-S)
  - she (1-P) goes to (1-A) Owner Lady
  - Owner Lady (1-P) is wailing (1-A) "look! Look! (1-A) what they (1-P) did (1-A)!"
  - Fiona (1-P) gives Owner Lady (1-P) a wee hug (1-A)
  - she (1-P) comforts (1-A) her (1-P)
  - Owner Lady (1-P) reaches into (1-A) bag (1-P)

• Owner Man (1-P) returns (1-A) from the left (1-A)
  - they (1-P) look at (1-A) the car (1-O)
  - they (1-P) talk (1-A)
  - they (1-P) stand (1-A) in front of driver's door (1-S)
  - Owner Man (1-P) holds (1-A) Owner Lady's (1-P) arms (1-P)
  - they (1-P) don't open (1-A) door (1-O)

• other
  - hooligans (1-P) didn't seem to discuss it (1-A)
  - they (1-P) concentrated on (1-A) the blue car (1-O)
  - they (1-P) were checking to see if it's easy to get in (1-A)
  - James (1-P) was a lookout (1-A)
  - didn't use an implement (1-O)
  - no one (1-P) got hurt (1-A)
  - no police (1-P) came (1-A)
  - hooligans (1-P) didn't damage/get in (1-A) car (1-O)
  - no one (1-P) interfered (1-A)
  - hooligans (1-P) didn't have keys (1-O)

Appendix M

Example of an interview (shown in Appendix J) in template form.

A) Free Recall Phase:

- parking lot (1-S)

- 2 men (2-P) and one girl (1-P)

- one man
    - about 6 feet 1 inches (1-P)
    - leather (1-P) jacket (1-P)
    - blue jeans (1-P)
    - no hat (1-P)

- other man
    - shorter, maybe 5 foot 11 (1-P)
    - dark/black/navy (1-P) anorak (1-P)
    - black (1-P) woollen (1-P) hat (1-P) not covering face (1-P)

- girl
    - back of the picture most of the time (1-S), but she (1-P) did come (1-A) to the fore (1-S)
    - leather (1-P) jacket (1-P)
    - hat (1-P)

- they (1-P) were trying (1-A) car doors (1-O), the one that they (1-P) paid attention to (1-A) was red (1-O) car (1-O) in the foreground (1-S)

- lady (1-P) passed by (1-A)
    - carrying an umbrella (1-O)

- man (1-P) with a little (1-P) boy (1-P) passed by (1-A)
    - they (1-P) bent down on the pavement (1-A) to do something (vague)
    - father (1-P) was anxious (1-A) and got (1-A) son (1-P) up and they (1-P) went off (1-A)

- there was a man (1-P) came out (1-A) to one of the cars (1-O) in the background (1-S) and he was carrying a briefcase (1-O)
    - he (1-P) opened (1-A) his car (1-O) and put (1-A) the briefcase (1-O) in, locked (1-A) it again and left (1-A)

- there was a man (1-P) on the left (1-S) of the cars (1-O), doing something (1-A) in the trunk of a car (1-O)

- young (but later says middle aged! so code that instead) couple (1-P, 1-P) wandered by (1-P)

- man (1-P) and a woman (1-P) came to get into (1-A) the car that they were trying to get into (1-O) and they (1-P) ran off (1-A)
    - the woman (1-P) was upset and crying (1-A)
    - man (1-P) ran after (1-A) them (1-P)
    - he (1-P) came back (1-A) to the car (1-S)

- a lady (1-P) came by (1-A)
    - young (1-P)
    - tall, later is more specific and says 5' 11" (1-P) and slim (1-P)
    - long (1-P) skirt (1-P)
    - over-blouse (1-P)
    - hat (1-P), panama not straw (1-P)

- another man (1-P) passed (1-P) carrying an umbrella (1-O)

- about 4 red cars (1-O)

- blue (1-O) car (1-O) that they (1-P) were mostly concentrating on (1-A)

B) Questioning Phase:

- were about 6 parking places (1-S) on the right (1-S)
    - one car (1-O) on the left (1-S)
    - trees (1-S), no houses (1-S)
    - paved (1-S)

- girl looking at cars
    - pants (1-P) were red orange (1-P)
    - hat was flat (1-P)
    - shorter than both men/about 5 foot 6 (1-P)
    - stocky (1-P)
    - in her late 20s (1-P)

- taller one
    - no facial hair (1-P)
    - early 30s (1-P)
    - medium build (vague)
    - dark hair (1-P) short (1-P)
    - the main picture was the taller man (1-S)

- last one
    - anorak not leather (1-P)
    - hat rolled up (1-P) but down over ears (1-P)
    - clean shaven (1-P)
    - he (1-P) came (1-A) forward nearer the end (1-S)
    - 25 to 30 (1-P)

- blue car
    - medium size (vague), cars were turned in the opposite direction, sideways to me (1-S)
- man in trunk – couldn't see the license plate number (1-S)
- lady with umbrella
    - beige (1-P) skirt (1-P) sweater (1-P)
    - curly hair (1-P) brown/lighter (1-P)
    - in 40s (1-P)
    - 5 foot 5 (1-P)
    - bit heavier than normal (1-P)
- man with little boy
    - was about 40 (1-P)
    - boy was about 7 (1-P) fairish (1-P)
    - about 5 foot 10 (1-P), medium build (vague)
    - could see something lying in the pavement (1-O) after
    - they went off (already) quickly (1-A)
    - wearing beige/light colours (1-P, 1-P)
    - they were going left (1-S)
- man with briefcase
    - wearing a suit (1-P)
    - he (1-P) was not paying any attention to anything (1-A)
    - about 5 foot 11 (1-P), no hat (1-P)
    - brown hair (1-P)
    - late 40s early 50s (1-P)
    - his car was red (1-O) bigger than the blue (1-O), facing right (1-S)
- man with umbrella
    - travelled (1-P) from the bottom to the top of the picture (1-S)
- man in trunk
    - light coloured clothes (1-P)
    - long pants (1-P)
    - 5 foot 6 to 6 feet tall (too vague?)
    - brownish hair (1-P)
    - had back to me (1-S)
- couple that wandered past
    - from the top of the picture to the bottom (1-S)
    - middle aged (1-P, 1-P)
    - man a bit taller than lady (1-P)
- people at the car (1-P) actually didn't get in (1-A) or take anything (1-A)
- woman car owner
    - 5 foot 4 (1-P)
    - stocky (1-P)

- short hair (1-P), brown (1-P)
- in 40s (1-P)

- man car owner
  - beige (1-P) pants (1-P)
  - jacket (1-P)
  - about 5 foot 10 (1-P)
  - about 45 to 50 (1-P)
  - stocky (1-P)

- car owners came from the left (1-S) by a path (1-S)

- young woman to help (1-A)
  - skirt was dark (1-P), had split (1-P)
  - sandals (1-P)
  - came from the right (1-S)
  - in her 20s (1-P)
  - blouse was light coloured (1-P)

- people at the car ran to the left (1-P, 1-P, 1-P)

C) Uncertain Responses:

Free Recall

- girl with leather jacket
  - hat had a peak (1-P), but not sure

- lady carrying umbrella
  - had a skirt (1-P), but not sure

Questioning Phase

- 'I don't know whether the man that was looking in the trunk was in the parking place'
  - don't score because not really sure what it means

- lady with umbrella
  - can't remember whether her hair was short or long, but I think more short (1-P)

- man with son
  - I don't know.. I think the boy had something in his hand and was putting it down but the man picked it up again

- man with briefcase
  - not sure about it but I, there was one car (1-O) in between the blue one and the one the man was putting briefcase into (1-S)

- man with umbrella
    - o dark clothing (1-P) but not sure

- couple who walked by
    - o didn't know if they had coats on or not (don't score, either/or)

- woman owner
    - o think she might have had glasses (1-P) on, but I'm not sure

- the girl might have gone up towards the left hand side of the picture (which girl? too vague?)

Appendix N

Measures used to rate the quality or interviews, showing rating scales for Social Quality (Part A) and criteria used to assess Technique Quality (Part B).

A) Rating scales designed to measure the Social Quality of interviews-

For each interview, assign a score from 1 (very bad) to 7 (very good) for the following.

How polite was the interviewer?
1 2 3 4 5 6 7

How friendly was the interviewer?
1 2 3 4 5 6 7

How considerate was the interviewer?
1 2 3 4 5 6 7

Was the interviewee rushed?
1 2 3 4 5 6 7

Did the interviewer and interviewee appear to have good rapport?
1 2 3 4 5 6 7

B) Technical Quality of interviews-

Indicate whether the following variables are present / absent in each interview.

Supportive/Active Listening:
This variable is present if the interviewer verbally demonstrates that s/he is listening, and encourages the witness/victim to continue speaking, by using small, non-intrusive phrases such as "mm hm", "yeah", "oh", etc. Cases in which the interviewer asks a complete question (e.g.-"Okay. So on the night of the robbery you were at your aunt's house?") are not considered to be examples of supportive listening, because they are more intrusive, as the interviewer takes control of the conversation while asking the question.

Uses Appropriate Vocabulary:
Questions are grammatically uncomplicated (i.e. they are easy to understand and aren't convoluted).

> e.g. of a BAD question: Did John not say later that he had not meant to give you that piece of cake?

Witness Compatible Questioning:

Score this variable as present if the topics of the interviewer's questions follow the same sequence as the topics presented by the witness/victim during his/her free recall, and if the interviewer does not 'jump around' between question topics.

> e.g.- if a witness described how she woke up and got dressed, ate breakfast, took out the garbage and then took her dog for a walk, but the interviewer first asks her questions about what she had for breakfast, then about getting dressed, followed by questions about where she went on her walk, and finally asks her what time she woke up
>
> e.g. - the investigator asks questions about the car, then switches to asking questions about the perpetrators, and reverts to asking questions about the car (by saying "if we could just go back to thinking about the car for a minute..." or something similar)
>
> NOTE – it is okay to re-probe a topic, if it is brought up at the end of the interview (as just a follow up type question) or if the interviewee re-visits the topic of his/her own volition.

Does not Interrupt:

An interruption occurs if the interviewer talks directly over top of the witness at any time during the course of the interview.

Does not Ask Multiple Questions:

A multiple question is when the interviewer asks about several things at once, without giving the witness/victim a chance to respond to each question. If the interviewer uses a multiple question more than once, score this variable as present

> e.g. "what did he look like? Was he carrying an umbrella?"

Does not Ask Leading/Misleading Questions:

A question is leading/misleading if it directs the interviewee to a particular response, i.e., if the question is worded so that it is not neutral (rather it suggests to the witness/victim by its form or content what the answer should be, indicates the interviewer's point of view, or includes an inference or assumption)

> e.g. – a witness has not mentioned anything about a robber having a get-away vehicle, and the interviewer asks "was the getaway car a blue Ford?"

Does not Re-ask Questions:

Score this variable if the interviewer does not re-ask questions that the interviewee has already answered (if the interviewer repeats a question because the witness/victim has not heard or understood the question the first time, it is not considered to be 're-asking' a question).

Appendix O

Tables showing the non-significant results for Study 2 (Chapter IV).

Table O.1

Non-significant results for gender analyses.

	F	MSE	p
Total correct details	$F(1,152) = .002$	3431.64	0.97
Total incorrect details	$F(1,152) = 1.46$	63.12	0.23
Total confabulated details	$F(1,152) = 1.75$	18.85	0.20
Accuracy	$F(1,152) = .002$	0.007	0.97
Completeness	$F(1,152) = 1.81$	0.005	0.18

Table O.2

Non-significant results for recall in the entire interview.

	Detail Type	F	MSE	p
CORRECT				
Interaction	Action	$F(4,143) = 1.38$	71.38	0.24
	Person	$F(4,143) = 0.86$	397.25	0.49
	Object	$F(4,143) = 0.53$	41.16	0.71
	Surrounding	$F(4,143) = 0.49$	66.13	0.74
	Total	$F(4,143) = 0.59$	1178.78	0.67
INCORRECT				
Age	Person	$F(2, 143) = 0.72$	35.62	0.49
	Surrounding	$F(2, 143) = 0.28$	1.78	0.76
	Total	$F(2, 143) = 2.19$	50.54	0.08
Interview	Action	$F(2, 143) = 0.11$	1.90	0.90
	Object	$F(2, 143) = 0.11$	1.18	0.89
	Surrounding	$F(2, 143) = 0.61$	1.78	0.55
	Total	$F(2, 143) = 2.35$	50.54	0.10
Interaction	Action	$F(4,143) = 1.39$	1.90	0.24
	Person	$F(4,143) = 0.20$	35.74	0.94
	Object	$F(4,143) = 0.67$	1.18	0.61
	Surrounding	$F(4,143) = 0.25$	1.78	0.91
	Total	$F(4,143) = 0.18$	50.54	0.95
CONFABULATED				
Age	Action	$F(2, 143) = 2.19$	1.23	0.12
	Person	$F(2, 143) = 0.71$	8.13	0.50
	Object	$F(2, 143) = 0.31$	0.81	0.73
	Surrounding	$F(2, 143) = 0.78$	0.36	0.46
	Total	$F(2, 143) = 0.89$	17.13	0.42
Interview	Person	$F(2, 143) = 1.59$	8.31	0.21
	Object	$F(2, 143) = 2.38$	0.81	0.10
	Surrounding	$F(2, 143) = 0.43$	0.36	0.65
Interaction	Action	$F(4, 143) = 1.73$	1.23	0.15
	Person	$F(4, 143) = 1.97$	8.13	0.10
	Object	$F(4, 143) = 1.32$	0.81	0.26
	Surrounding	$F(4, 143) = 0.26$	0.36	0.91
	Total	$F(4, 143) = 2.03$	17.13	0.09

Table O.3
Non-Significant results for participant performance across the free recall phase.

	Detail Type	F	MSE	p
CORRECT				
Age	Surrounding	$F(2, 143) = 2.38$	30.50	0.10
Interaction	Action	$F(4, 143) = 1.30$	46.43	0.27
	Person	$F(4, 143) = 0.66$	198.04	0.62
	Object	$F(4, 143) = 0.54$	21.48	0.71
	Surrounding	$F(4, 143) = 0.26$	30.50	0.91
	Total	$F(4, 143) = 0.53$	645.14	0.71
INCORRECT				
Age	Person	$F(2, 143) = 0.15$	4.65	0.86
	Surrounding	$F(2, 143) = .80$	0.97	0.45
	Total	$F(2, 143) = 1.64$	10.54	0.20
Interview	Person	$F(2, 143) = 0.53$	4.65	0.59
	Object	$F(2, 143) = 2.52$	0.35	0.08
	Total	$F(2, 143) = 1.26$	10.54	0.29
Interaction	Action	$F(4, 143) = 1.68$	1.12	0.16
	Person	$F(4, 143) = 0.27$	4.65	0.90
	Object	$F(4, 143) = 1.39$	0.35	0.24
	Surrounding	$F(4, 143) = 0.76$	0.97	0.56
	Total	$F(4, 143) = 0.59$	10.54	0.67
CONFABULATED				
Age	Action	$F(2, 143) = 0.93$	0.30	0.40
	Person	$F(2, 143) = .89$	1.00	0.41
	Object	$F(2, 143) = 0.32$	0.18	0.73
	Surrounding	$F(2, 143) = 1.65$	0.01	0.20
	Total	$F(2, 143) = 1.26$	2.58	0.29
Interview	Action	$F(2, 143) = 2.47$	0.30	0.09
	Person	$F(2, 143) = 2.27$	1.00	0.11
	Object	$F(2, 143) = .94$	0.18	0.39
	Surrounding	$F(2, 143) = 0.29$	0.01	0.75
	Total	$F(2, 143) = 2.42$	2.58	0.09
Interaction	Action	$F(4, 143) = 0.22$	0.30	0.93
	Object	$F(4, 143) = 1.08$	0.18	0.37
	Surrounding	$F(4, 143) = 0.57$	0.01	0.69
	Total	$F(4, 143) = 1.51$	2.58	0.20

Table O.4
Non-Significant results for recall in the questioning phase.

	Detail Type	F	MSE	p
CORRECT				
Age	Action	$F(2, 143) = 0.13$	30.39	0.88
Interview	Action	$F(2, 143) = 2.27$	30.39	0.11
	Person	$F(2, 143) = 0.38$	174.48	0.69
	Object	$F(2, 143) = 1.91$	13.93	0.15
	Surrounding	$F(2, 143) = 2.43$	31.49	0.09
	Total	$F(2, 143) = 0.42$	471.45	0.41
Interaction				
	Action	$F(4, 143) = 1.01$	30.39	0.41
	Person	$F(4, 143) = 0.46$	174.48	0.77
	Object	$F(4, 143) = 0.29$	13.93	0.88
	Surrounding	$F(4, 143) = 0.94$	31.49	0.44
	Total	$F(4, 143) = 0.33$	471.45	0.33
INCORRECT				
Age	Action	$F(2, 143) = 1.36$	0.55	0.26
	Person	$F(2, 143) = 1.16$	29.13	0.32
	Surrounding	$F(2, 143) = 0.73$	1.38	0.48
	Total	$F(2, 143) = 2.06$	37.53	0.13
Interview	Object	$F(2, 143) = 1.43$	1.40	0.24
	Surrounding	$F(2, 143) = 0.46$	1.38	0.63
Interaction	Action	$F(4, 143) = 0.90$	0.55	0.47
	Person	$F(4, 143) = 0.31$	29.13	0.87
	Object	$F(4, 143) = 0.73$	1.40	0.58
	Surrounding	$F(4, 143) = 0.74$	1.38	0.57
	Total	$F(4, 143) = 0.76$	37.53	0.63
CONFABULATED				
Age	Action	$F(2, 143) = 2.30$	0.72	0.10
	Person	$F(2, 143) = 0.75$	4.84	0.47
	Object	$F(2, 143) = 0.38$	0.52	0.69
	Total	$F(2, 143) = 0.87$	10.19	0.42
Interview	Person	$F(2, 143) = 1.70$	4.84	0.19
	Object	$F(2, 143) = 1.75$	0.52	0.18
	Surrounding	$F(2, 143) = 1.06$	0.30	0.35
Interaction	Action	$F(4, 143) = 1.99$	0.72	0.10
	Person	$F(4, 143) = 1.33$	4.84	0.26
	Object	$F(4, 143) = 1.57$	0.52	0.18
	Surrounding	$F(4, 143) = 0.30$	0.30	0.88
	Total	$F(4, 143) = 1.65$	10.19	0.17

Table O.5

Non-Significant results for recall that expressed Uncertainty, in the free recall phase, questioning phase and entire interview.

	Phase	F	MSE	p
CORRECT				
Age	Free Recall	$F(2, 143) = 1.45$	0.22	0.24
	Questioning	$F(2, 143) = 1.17$	1.64	0.31
	Entire	$F(2, 143) = 1.69$	1.93	0.19
Interview	Free Recall	$F(2, 143) = 0.32$	0.22	0.73
	Questioning	$F(2, 143) = 1.82$	1.64	0.17
	Entire	$F(2, 143) = 1.28$	1.93	0.28
Interaction	Free Recall	$F(4, 143) = 1.08$	0.22	0.37
	Questioning	$F(4, 143) = 0.99$	1.64	0.41
	Entire	$F(4, 143) = 0.73$	1.93	0.57
INCORRECT				
Age	Free Recall	$F(2, 143) = 0.48$	0.13	0.62
	Questioning	$F(2, 143) = 0.19$	1.09	0.83
	Entire	$F(2, 143) = 0.11$	1.22	0.90
Interview	Free Recall	$F(2, 143) = 0.12$	0.13	0.89
	Questioning	$F(2, 143) = 0.41$	1.09	0.67
	Entire	$F(2, 143) = 0.44$	1.22	0.65
Interaction	Free Recall	$F(4, 143) = 0.85$	0.13	0.50
	Questioning	$F(4, 143) = 0.89$	1.09	0.50
	Entire	$F(4, 143) = 1.05$	1.22	0.38
CONFABULATED				
Age	Free Recall	$F(2, 143) = 0.39$	0.04	0.68
	Questioning	$F(2, 143) = 0.29$	0.29	0.75
	Entire	$F(2, 143) = 0.17$	0.31	0.84
Interview	Free Recall	$F(2, 143) = 0.20$	0.04	0.82
	Questioning	$F(2, 143) = 0.01$	0.29	0.99
	Entire	$F(2, 143) = 0.07$	0.31	0.94
Interaction	Free Recall	$F(4, 143) = 0.66$	0.04	0.62
	Questioning	$F(4, 143) = 0.84$	0.28	0.50
	Entire	$F(4, 143) = 1.14$	0.31	0.32

Table O.6

Non-significant results for accuracy and completeness scores.

	Phase	F	MSE	p
ACCURACY				
Interview	Free Recall	$F(2, 143) = 1.18$	0.002	0.31
Interaction	Free Recall	$F(4, 143) = 0.50$	0.002	0.74
	Questioning	$F(4, 143) = 1.58$	0.006	0.18
	Entire	$F(4, 143) = 1.07$	0.002	0.37
COMPLETENESS				
Interview	Questioning	$F(2, 143) = 0.40$	0.001	0.67
Interaction	Free Recall	$F(4, 143) = 0.43$	0.001	0.79
	Questioning	$F(4, 143) = 0.32$	0.001	0.86
	Entire	$F(4, 143) = 0.53$	0.001	0.72

<u>Appendix P</u>
Unadjusted means for Study 2 (Chapter IV)

Table P.1
Mean number of correct, incorrect and confabulated details recalled in the entire interview, as a function of age and interview type (Standard Deviations in brackets)

	Action	Person	Object	Surrounding	Total
Correct					
Young					
SI	26.41 (3.47)	86.65 (14.58)	17.82 (5.43)	15.18 (5.05)	146.06 (20.69)
MCI	35.18 (9.26)	112.29 (28.16)	22.94 (6.98)	21.35 (7.98)	191.76 (47.72)
ECI	38.88 (9.22)	125.24 (22.03)	25.47 (7.99)	26.12 (9.79)	215.00 (39.44)
Total	33.49 (9.29)	108.06 (27.19)	22.08 (7.47)	20.88 (8.93)	184.27 (46.90)
Young-old					
SI	28.22 (8.76)	72.89 (19.31)	18.61 (4.80)	19.67 (6.75)	139.39 (30.90)
MCI	36.65 (10.79)	96.71 (34.06)	22.06 (9.97)	22.76 (9.98)	178.18 (58.57)
ECI	42.71 (12.20)	102.88 (27.30)	27.88 (7.83)	31.82 (12.01)	205.29 (50.57)
Total	35.71 (12.05)	90.48 (29.92)	22.77 (8.55)	24.65 (10.90)	173.62 (54.33)
Old-old					
SI	21.53 (8.59)	47.47 (19.82)	11.12 (4.81)	8.06 (5.57)	88.18 (31.05)
MCI	26.47 (9.86)	54.18 (17.99)	14.35 (4.91)	11.59 (6.59)	107.00 (30.29)
ECI	26.88 (10.33)	62.65 (26.00)	17.59 (8.12)	20.65 (13.25)	127.76 (52.11)
Total	24.96 (9.74)	54.76 (22.02)	14.35 (6.58)	13.43 (10.42)	107.65 (41.68)
Total					
SI	25.44 (7.79)	69.08 (24.04)	15.90 (5.97)	14.40 (7.51)	124.83 (37.79)
MCI	32.76 (10.79)	87.73 (36.66)	19.78 (8.38)	18.57 (9.56)	158.98 (59.41)
ECI	36.16 (12.46)	96.92 (35.97)	23.65 (8.99)	26.20 (12.42)	182.69 (61.15)
Incorrect					
Young					
SI	1.00 (1.37)	10.76 (5.11)	0.65 (0.70)	1.24 (1.30)	13.59 (6.17)
MCI	0.71 (1.05)	13.06 (8.66)	1.06 (1.39)	1.65 (1.12)	16.47 (10.15)
ECI	0.65 (0.70)	10.88 (5.36)	0.82 (1.13)	1.94 (1.44)	14.29 (5.73)
Total	0.78 (1.06)	11.57 (6.53)	0.84 (1.10)	1.61 (1.30)	14.22 (7.56)
Young-old					
SI	1.33 (1.50)	14.61 (5.35)	1.61 (1.38)	2.00 (1.50)	19.56 (6.76)
MCI	1.88 (1.80)	16.18 (7.32)	1.82 (1.47)	1.88 (1.41)	21.76 (8.69)
ECI	2.35 (2.34)	12.94 (5.87)	2.06 (1.52)	2.12 (1.73)	19.47 (7.82)
Total	1.85 (1.91)	14.58 (6.24)	1.83 (1.44)	2.00 (1.52)	20.25 (7.70)
Old-old					
SI	0.82 (0.95)	11.41 (7.43)	2.12 (1.32)	1.24 (1.09)	15.59 (8.75)
MCI	1.06 (1.14)	9.76 (5.67)	1.53 (1.46)	1.35 (1.22)	13.76 (6.68)
ECI	0.76 (0.66)	8.94 (5.11)	1.71 (1.57)	1.88 (1.27)	13.29 (6.48)
Total	0.88 (0.93)	10.04 (6.11)	1.78 (1.45)	1.49 (1.21)	14.22 (7.29)
Total					
SI	1.06 (1.29)	12.31 (6.16)	1.46 (1.31)	1.50 (1.34)	16.31 (7.58)
MCI	1.22 (1.43)	13.00 (7.64)	1.47 (1.45)	1.63 (1.25)	17.33 (9.09)
ECI	1.25 (1.64)	10.92 (5.59)	1.53 (1.49)	1.98 (1.46)	15.69 (7.14)

	Action	Person	Object	Surrounding	Total
Confabulated					
Young					
SI	0.18 (0.53)	0.88 (1.11)	0.18 (0.39)	0.35 (0.70)	1.59 (1.70)
MCI	0.12 (0.33)	1.12 (1.36)	0.35 (0.70)	0.29 (0.77)	1.88 (2.03)
ECI	0.24 (0.56)	1.35 (1.99)	0.30 (0.79)	0.41 (0.62)	2.35 (2.23)
Total	0.18 (0.48)	1.12 (1.51)	0.29 (0.64)	0.35 (0.69)	1.94 (1.98)
Young-old					
SI	1.56 (2.83)	3.67 (6.78)	0.78 (1.26)	0.39 (0.78)	6.39 (9.93)
MCI	0.47 (0.72)	1.35 (1.50)	0.24 (0.56)	0.29 (0.59)	2.35 (2.42)
ECI	0.41 (0.87)	1.24 (1.99)	0.29 (0.47)	0.18 (0.53)	2.12 (3.12)
Total	0.83 (1.83)	2.12 (4.31)	0.44 (0.87)	0.29 (0.64)	3.67 (6.46)
Old-old					
SI	0.29 (0.77)	0.94 (1.20)	0.82 (1.88)	0.18 (0.53)	2.24 (3.44)
MCI	0.18 (0.53)	0.82 (1.29)	0.24 (0.44)	0.12 (0.33)	1.35 (1.90)
ECI	0.12 (0.33)	1.94 (3.31)	0.12 (0.33)	0.18 (0.39)	2.35 (3.66)
Total	0.20 (0.57)	1.24 (2.18)	0.39 (1.15)	0.16 (0.42)	1.98 (3.07)
Total					
SI	0.69 (1.83)	1.87 (4.23)	0.60 (1.33)	0.31 (0.67)	3.46 (6.49)
MCI	0.25 (0.56)	1.10 (1.38)	0.27 (0.57)	0.24 (0.59)	1.86 (2.13)
ECI	0.25 (0.63)	1.51 (2.47)	0.25 (0.56)	0.25 (0.52)	2.27 (3.00)

Table P.2

Mean number of correct, incorrect and confabulated details recalled in the free recall phase, as a function of age and interview type (Standard Deviations in brackets)

	Action	Person	Object	Surround	Total
Correct					
Young					
SI	17.12 (4.69)	38.12 (11.52)	9.53 (3.59)	3.65 (3.08)	68.41 (18.71)
MCI	29.41 (8.60)	59.47 (18.09)	15.65 (4.37)	7.35 (4.82)	111.88 (31.52)
ECI	32.06 (8.51)	68.35 (17.42)	16.88 (5.85)	11.59 (6.48)	128.88 (31.28)
Total	26.20 (9.85)	55.31 (20.21)	14.02 (5.63)	7.53 (5.89)	103.06 (37.47)
Young-old					
SI	19.50 (7.54)	37.78 (16.55)	11.67 (4.89)	6.50 (5.73)	75.44 (30.96)
MCI	29.94 (9.97)	54.47 (25.46)	15.47 (6.95)	11.00 (6.77)	110.82 (44.04)
ECI	33.65 (8.93)	58.94 (18.49)	19.24 (5.30)	15.94 (8.35)	126.82 (37.05)
Total	27.54 (10.60)	50.15 (22.09)	15.38 (6.46)	11.06 (7.91)	103.81 (42.84)
Old-old					
SI	13.65 (5.78)	18.41 (9.72)	5.35 (2.47)	1.59 (2.32)	39.00 (16.63)
MCI	18.76 (5.71)	25.24 (10.43)	9.71 (3.98)	3.47 (2.92)	57.59 (16.40)
ECI	20.71 (7.36)	32.88 (15.33)	11.41 (5.82)	9.24 (9.14)	74.24 (33.42)
Total	17.71 (6.89)	25.51 (13.26)	8.82 (4.95)	4.76 (6.48)	56.94 (27.26)
Total					
SI	16.81 (6.50)	31.56 (15.75)	8.90 (4.58)	3.96 (4.50)	61.23 (27.74)
MCI	26.04 (9.64)	46.39 (24.07)	13.61 (5.87)	7.27 (5.87)	93.43 (40.99)
ECI	28.80 (9.99)	53.39 (22.61)	15.84 (6.46)	12.25 (8.39)	109.98 (41.98)
Incorrect					
Young					
SI	0.47 (1.01)	2.41 (2.27)	0.06 (0.24)	0.18 (0.39)	3.06 (2.75)
MCI	0.59 (1.06)	2.94 (2.97)	0.24 (0.44)	0.06 (0.24)	3.82 (3.99)
ECI	0.29 (0.47)	2.94 (2.11)	0.24 (0.56)	1.06 (2.02)	4.06 (2.84)
Total	0.45 (0.88)	2.76 (2.44)	0.18 (0.43)	0.43 (1.25)	3.65 (3.21)
Young-old					
SI	0.50 (0.99)	2.89 (2.11)	0.28 (0.46)	0.44 (0.62)	4.11 (2.89)
MCI	1.35 (1.50)	3.65 (3.39)	0.88 (0.86)	0.53 (1.18)	6.41 (5.10)
ECI	1.65 (1.73)	2.94 (1.98)	0.88 (1.11)	1.12 (1.22)	6.59 (4.33)
Total	1.15 (1.49)	3.15 (2.54)	0.67 (0.88)	0.69 (1.06)	5.67 (4.26)
Old-old					
SI	0.29 (0.59)	1.47 (1.63)	0.12 (0.33)	0.12 (0.33)	2.00 (1.15)
MCI	0.65 (0.79)	1.88 (2.03)	0.35 (0.49)	0.47 (0.87)	3.35 (2.52)
ECI	0.65 (0.70)	2.24 (1.72)	0.18 (0.53)	0.82 (0.95)	3.88 (3.30)
Total	0.53 (0.70)	1.86 (1.79)	0.22 (0.46)	0.47 (0.81)	3.08 (2.76)
Total					
SI	0.42 (0.87)	2.27 (2.07)	0.15 (0.36)	0.25 (0.48)	3.08 (2.71)
MCI	0.86 (1.18)	2.82 (2.89)	0.49 (0.67)	0.35 (0.87)	4.53 (4.16)
ECI	0.86 (1.23)	2.71 (1.93)	0.43 (0.83)	1.00 (1.44)	4.84 (3.69)

	Action	Person	Object	Surrounding	Total
Confabulated					
Young					
SI	0.12 (0.49)	0.35 (0.70)	0.12 (0.33)	0.00 (0.00)	0.59 (0.80)
MCI	0.12 (0.33)	0.53 (0.94)	0.12 (0.49)	0.00 (0.00)	0.76 (1.15)
ECI	0.06 (0.24)	0.35 (0.70)	0.24 (0.56)	0.06 (0.24)	0.71 (0.11)
Total	0.10 (0.36)	0.41 (0.78)	0.16 (0.46)	0.02 (0.14)	0.69 (1.01)
Young-old					
SI	0.44 (0.92)	1.17 (1.86)	0.28 (0.58)	0.06 (0.24)	1.94 (2.78)
MCI	0.29 (0.69)	0.65 (1.17)	0.00 (0.00)	0.18 (0.53)	1.12 (2.26)
ECI	0.12 (0.33)	0.12 (0.33)	0.12 (0.33)	0.12 (0.49)	0.47 (0.94)
Total	0.29 (0.70)	0.65 (1.34)	0.13 (0.40)	0.12 (0.43)	1.19 (2.20)
Old-old					
SI	0.24 (0.75)	0.29 (0.69)	0.18 (0.53)	0.00 (0.00)	0.71 (1.90)
MCI	0.18 (0.53)	0.47 (1.01)	0.18 (0.39)	0.06 (0.24)	0.88 (1.45)
ECI	0.06 (0.24)	0.65 (1.06)	0.06 (0.24)	0.18 (0.53)	0.94 (1.39)
Total	0.16 (0.54)	0.47 (0.92)	0.14 (0.40)	0.08 (0.27)	0.84 (1.57)
Total					
SI	0.27 (0.74)	0.62 (1.27)	0.19 (0.49)	0.02 (0.14)	1.10 (2.07)
MCI	0.20 (0.53)	0.55 (1.03)	0.10 (0.36)	0.08 (0.34)	0.92 (1.66)
ECI	0.08 (0.27)	0.37 (0.77)	0.14 (0.40)	0.12 (0.38)	0.71 (1.15)

Table P.3

Mean number of correct, incorrect and confabulated details recalled in the questioning phase, as a function of age and interview type (Standard Deviations in brackets)

	Action	Person	Object	Surround	Total
Correct					
Young					
SI	9.29 (5.35)	48.53 (12.89)	8.29 (4.65)	11.53 (3.86)	77.65 (21.47)
MCI	5.94 (3.91)	52.82 (14.86)	7.29 (4.10)	14.00 (4.80)	80.06 (22.96)
ECI	6.82 (4.85)	56.88 (13.66)	8.59 (3.71)	14.53 (6.05)	86.12 (19.61)
Total	7.35 (4.86)	52.75 (13.98)	8.06 (4.13)	13.35 (5.06)	81.27 (21.27)
Young-old					
SI	8.72 (7.41)	35.11 (11.91)	6.94 (2.60)	13.17 (5.59)	63.94 (21.17)
MCI	6.71 (5.34)	42.24 (15.45)	6.59 (4.98)	11.76 (6.67)	67.35 (27.40)
ECI	9.06 (5.84)	43.94 (17.20)	8.65 (3.66)	15.88 (7.24)	77.59 (28.47)
Total	8.17 (6.25)	40.33 (15.17)	7.38 (3.88)	13.60 (6.61)	69.52 (25.95)
Old-old					
SI	7.88 (5.38)	29.06 (13.73)	5.76 (4.02)	6.47 (4.42)	49.18 (21.21)
MCI	7.71 (5.92)	28.94 (12.07)	4.65 (3.02)	8.12 (5.46)	49.41 (19.71)
ECI	6.18 (5.19)	29.82 (12.82)	6.18 (3.26)	11.47 (7.09)	53.65 (22.95)
Total	7.25 (5.45)	29.27 (12.64)	5.53 (3.46)	8.69 (6.03)	50.75 (21.00)
Total					
SI	8.63 (6.06)	37.52 (14.99)	7.00 (3.90)	10.44 (5.43)	63.60 (23.88)
MCI	6.78 (5.08)	41.33 (17.06)	6.18 (4.18)	11.29 (6.09)	65.61 (26.35)
ECI	7.35 (5.35)	43.55 (18.81)	7.80 (3.67)	13.96 (6.93)	72.45 (27.27)
Incorrect					
Young					
SI	0.53 (0.87)	8.29 (4.82)	0.65 (0.70)	1.06 (1.20)	9.94 (5.79)
MCI	0.12 (0.33)	10.12 (6.91)	0.82 (1.24)	1.59 (1.12)	12.65 (7.60)
ECI	0.35 (0.61)	7.94 (4.85)	0.59 (0.80)	1.35 (1.17)	10.24 (4.91)
Total	0.33 (0.65)	8.78 (5.58)	0.69 (0.93)	1.33 (1.16)	10.94 (6.20)
Young-old					
SI	0.83 (1.25)	11.72 (5.05)	1.33 (1.24)	1.56 (1.54)	15.44 (6.27)
MCI	0.53 (0.72)	12.53 (5.84)	0.94 (1.20)	1.35 (1.06)	15.35 (6.27)
ECI	0.71 (0.85)	10.00 (4.98)	1.18 (1.51)	1.00 (1.23)	12.88 (5.97)
Total	0.69 (0.96)	11.42 (5.30)	1.15 (1.30)	1.31 (1.29)	14.58 (6.17)
Old-old					
SI	0.53 (0.72)	9.94 (7.05)	2.00 (1.32)	1.12 (1.05)	13.59 (7.88)
MCI	0.41 (0.62)	7.88 (5.37)	1.18 (1.24)	0.94 (1.14)	10.41 (6.68)
ECI	0.12 (0.33)	6.88 (4.27)	1.41 (1.18)	0.94 (0.90)	9.35 (4.64)
Total	0.35 (0.59)	8.24 (5.71)	1.53 (1.27)	1.00 (1.02)	11.12 (6.66)
Total					
SI	0.63 (0.97)	10.02 (5.78)	1.33 (1.23)	1.25 (1.28)	13.04 (6.96)
MCI	0.35 (0.59)	10.18 (6.02)	0.98 (1.21)	1.29 (1.12)	12.80 (7.04)
ECI	0.39 (0.67)	8.27 (4.80)	1.06 (1.22)	1.10 (1.10)	10.82 (5.32)

	Action	Person	Object	Surrounding	Total
Confabulated					
Young					
SI	0.06 (0.24)	0.53 (0.94)	0.06 (0.24)	0.35 (0.70)	1.00 (1.50)
MCI	0.00 (0.00)	0.59 (1.28)	0.24 (0.56)	0.29 (0.77)	1.12 (1.54)
ECI	0.12 (0.49)	0.94 (1.44)	0.24 (0.56)	0.35 (0.61)	1.65 (1.66)
Total	0.06 (0.31)	0.69 (1.23)	0.18 (0.48)	0.33 (0.68)	1.25 (1.56)
Young-old					
SI	1.11 (2.27)	2.50 (5.10)	0.50 (1.04)	0.33 (0.77)	4.44 (7.64)
MCI	0.18 (0.39)	0.71 (1.16)	0.24 (0.56)	0.12 (0.33)	1.24 (1.60)
ECI	0.29 (0.77)	1.12 (1.99)	0.18 (0.39)	0.06 (0.24)	1.65 (3.12)
Total	0.54 (1.46)	1.46 (3.31)	0.31 (0.73)	0.17 (0.51)	2.48 (5.04)
Old-old					
SI	0.06 (0.24)	0.65 (0.93)	0.65 (1.50)	0.18 (0.53)	1.53 (2.10)
MCI	0.00 (0.00)	0.35 (0.49)	0.06 (0.24)	0.06 (0.24)	0.47 (0.72)
ECI	0.06 (0.24)	1.29 (2.39)	0.06 (0.24)	0.00 (0.00)	1.41 (2.62)
Total	0.04 (0.20)	0.76 (1.53)	0.25 (0.91)	0.08 (0.33)	1.14 (2.00)
Total					
SI	0.42 (1.42)	1.25 (3.17)	0.40 (1.07)	0.29 (0.67)	2.37 (4.89)
MCI	0.06 (0.24)	0.55 (1.03)	0.18 (0.48)	0.16 (0.51)	0.94 (1.36)
ECI	0.16 (0.54)	1.12 (1.95)	0.16 (0.42)	0.14 (0.40)	1.57 (2.49)

Table P.4

Mean number of correct, incorrect and confabulated details recalled with uncertainty, as a function of age and interview type (Standard Deviations in brackets)

	Free Recall Phase	Questioning Phase	Entire Interview
Correct			
Young			
SI	0.00 (0.00)	1.53 (1.33)	1.53 (1.33)
MCI	0.41 (0.87)	1.00 (1.23)	1.41 (1.77)
ECI	0.29 (0.59)	1.12 (1.17)	1.41 (1.42)
Total	0.24 (0.62)	1.22 (1.24)	1.45 (1.49)
Young-old			
SI	0.17 (0.38)	1.28 (1.67)	1.44 (1.95)
MCI	0.12 (0.33)	1.35 (1.73)	1.47 (1.74)
ECI	0.35 (0.70)	0.76 (0.97)	1.00 (0.94)
Total	0.21 (0.50)	1.13 (1.50)	1.31 (1.59)
Old-old			
SI	0.06 (0.24)	0.59 (1.28)	1.44 (1.95)
MCI	0.00 (0.00)	0.35 (0.61)	1.47 (1.74)
ECI	0.24 (0.56)	0.82 (1.47)	1.00 (0.94)
Total	0.10 (0.36)	0.59 (1.17)	1.31 (1.59)
Total			
SI	0.08 (0.27)	1.13 (1.47)	0.65 (1.32)
MCI	0.18 (0.56)	0.90 (1.32)	0.35 (0.61)
ECI	0.29 (0.61)	0.90 (1.20)	1.06 (1.56)
Incorrect			
Young			
SI	0.18 (0.53)	0.94 (1.19)	1.12 (1.36)
MCI	0.12 (0.49)	0.41 (0.71)	0.53 (0.80)
ECI	0.12 (0.33)	0.71 (0.59)	0.82 (0.73)
Total	0.14 (0.45)	0.69 (0.88)	0.82 (1.01)
Young-old			
SI	0.06 (0.24)	0.78 (0.88)	0.83 (0.92)
MCI	0.06 (0.24)	1.06 (1.30)	1.12 (1.27)
ECI	0.24 (0.56)	0.94 (1.14)	1.18 (1.29)
Total	0.12 (0.38)	0.92 (1.10)	1.04 (1.15)
Old-old			
SI	0.06 (0.24)	0.65 (1.06)	0.71 (1.05)
MCI	0.06 (0.24)	0.65 (1.27)	0.71 (1.36)
ECI	0.00 (0.00)	0.53 (1.07)	0.53 (1.07)
Total	0.04 (0.20)	0.61 (1.12)	0.65 (1.15)
Total			
SI	0.10 (0.36)	0.79 (1.04)	0.88 (1.11)
MCI	0.08 (0.34)	0.71 (1.14)	0.78 (1.17)
ECI	0.12 (0.38)	0.73 (0.96)	0.84 (1.07)

	Free Recall Phase	Questioning Phase	Entire Interview
Confabulated			
Young			
SI	0.00 (0.00)	0.12 (0.49)	0.12 (0.49)
MCI	0.00 (0.00)	0.06 (0.24)	0.06 (0.24)
ECI	0.12 (0.49)	0.29 (0.77)	0.41 (0.87)
Total	0.04 (0.28)	0.16 (0.54)	0.20 (0.60)
Young-old			
SI	0.00 (0.00)	0.22 (0.55)	0.22 (0.55)
MCI	0.06 (0.24)	0.35 (1.06)	0.41 (1.06)
ECI	0.06 (0.24)	0.12 (0.33)	0.18 (0.39)
Total	0.04 (0.19)	0.23 (0.70)	0.27 (0.72)
Old-old			
SI	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
MCI	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
ECI	0.00 (0.00)	0.12 (0.49)	0.12 (0.49)
Total	0.00 (0.00)	0.04 (0.28)	0.04 (0.28)
Total			
SI	0.00 (0.00)	0.12 (0.43)	0.12 (0.43)
MCI	0.02 (0.14)	0.14 (0.63)	0.16 (0.64)
ECI	0.06 (0.31)	0.18 (0.56)	0.24 (0.62)

Table P.5

Mean accuracy of recall scores in the free recall phase, questioning phase and entire interview, as a function of age and interview type (showing Standard Deviations in brackets)

	Free Recall Phase	Questioning Phase	Entire Interview
Young			
SI	0.95 (0.04)	0.87 (0.07)	0.91 (0.04)
MCI	0.96 (0.03)	0.86 (0.06)	0.92 (0.04)
ECI	0.97 (0.02)	0.88 (0.04)	0.93 (0.02)
Total	0.96 (0.03)	0.87 (0.06)	0.92 (0.03)
Young-old			
SI	0.92 (0.04)	0.77 (0.10)	0.84 (0.06)
MCI	0.94 (0.03)	0.80 (0.07)	0.88 (0.03)
ECI	0.95 (0.02)	0.84 (0.05)	0.91 (0.03)
Total	0.94 (0.03)	0.80 (0.08)	0.88 (0.05)
Old-old			
SI	0.93 (0.07)	0.77 (0.09)	0.83 (0.08)
MCI	0.93 (0.04)	0.83 (0.08)	0.88 (0.05)
ECI	0.93 (0.06)	0.82 (0.10)	0.88 (0.06)
Total	0.93 (0.06)	0.81 (0.09)	0.86 (0.07)
Total			
SI	0.94 (0.05)	0.80 (0.10)	0.86 (0.07)
MCI	0.95 (0.04)	0.83 (0.08)	0.89 (0.04)
ECI	0.95 (0.04)	0.85 (0.07)	0.91 (0.04)

Table P.6

Mean completeness of recall scores in the free recall phase, questioning phase and entire interview, as a function of age and interview type (Standard Deviations in brackets)

	Free Recall Phase	Questioning Phase	Entire Interview
Young			
SI	0.10 (0.03)	0.11 (0.03)	0.21 (0.03)
MCI	0.16 (0.05)	0.11 (0.03)	0.27 (0.07)
ECI	0.18 (0.04)	0.12 (0.03)	0.31 (0.06)
Total	0.15 (0.05)	0.12 (0.03)	0.26 (0.07)
Young-old			
SI	0.11 (0.04)	0.09 (0.03)	0.20 (0.04)
MCI	0.16 (0.06)	0.10 (0.04)	0.26 (0.08)
ECI	0.18 (0.05)	0.11 (0.04)	0.29 (0.07)
Total	0.15 (0.06)	0.10 (0.04)	0.25 (0.08)
Old-old			
SI	0.06 (0.02)	0.07 (0.03)	0.13 (0.04)
MCI	0.08 (0.02)	0.07 (0.03)	0.15 (0.04)
ECI	0.11 (0.05)	0.08 (0.03)	0.18 (0.07)
Total	0.08 (0.04)	0.07 (0.03)	0.15 (0.06)
Total			
SI	0.09 (0.04)	0.09 (0.03)	0.18 (0.05)
MCI	0.13 (0.06)	0.09 (0.04)	0.23 (0.08)
ECI	0.16 (0.06)	0.10 (0.04)	0.26 (0.09)

Appendix Q

Instructions to officers from Study 2 (Chapter 4), asking them to determine which aspects of the video are the most important.

KENT

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AT CANTERBURY

INTERVIEWING WITNESSES AND VICTIMS

This study is part of an ongoing research project to examine various interviewing methods that could be used to help older adult (i.e. over the age of 60) eyewitnesses and/or victims of crime remember more about what they have seen. Specifically, it will identify the information police officers think is important for witnesses to report.

Participation is completely voluntary, and you may withdraw from the study at ANY time without giving a reason, and without suffering any consequences for your decision. The study should take approximately 35-45 minutes to complete.

Names and any details which could be used to identify specific individuals will not be included in any of the reports produced from this study, made publicly available, or given to any other person. Instead, each participant will be assigned a number that will be used in all subsequent analyses and reports.

This work is being conducted as part of a PhD degree at the University of Kent, under the supervision of Dr. Robyn Holliday (phone 01227823087). If you have any questions or concerns, please do not hesitate to contact either myself or Dr. Holliday. Thank-you!

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Instructions:

Please imagine that a series of car thefts have been occurring in the area. You have been asked to investigate the latest incident, in which the thieves were interrupted and chased away by the car owners. At the time, Mr. Murray was sitting nearby in a parked car, and observed the entire event.

You will be asked to watch a short (approx. 3 min) film about the attempted car robbery. The film shows exactly what Mr. Murray saw. Please assume that he does not know any of the people depicted in the film, and that he did not have any knowledge about the car park prior to witnessing the event.

Please think about what information in the film would be relevant to a criminal investigation. In other words, what information would be useful or important to obtain from Mr. Murray in order to assist your investigation? It may help to imagine that you are writing Mr. Murray's witness statement – what information from the film should be included in this statement?

In the space below, please write the information that you consider to be relevant/important about this incident. Be as detailed and thorough as you normally would be when taking a witness statement (continue on the next page if necessary). You can watch the video as many times as you like.

General Information:

1) Please indicate your

    Age:

    Rank of office:

    Gender:

    Number of years served with police force:

2) How many years' experience do you have interviewing witnesses/victims?

3) If you have any comments about this study, I would welcome hearing them.

Debrief:

Most investigative interviewing research follows the same basic structure – participants watch a simulated incident and after a certain period of time are asked to remember what they have seen in an interview.

Typically, different participants are given different types of interviews. The testimony elicited from these interviews is then scored for accuracy, and the accuracy rates of each type of interview are compared to see which interview is the most effective.

In the past, academic researchers have developed the scoring systems used in such studies. However, it is likely that police officers' experience would make them better able to judge what information is and is not important to include in an interview scoring system. The information you have provided will be used to construct a new interview scoring system.

Appendix R

List of details considered forensically important / investigatively relevant[1] by police officers in Study 2 (Chapter IV).

- R v. TURNBULL – ALL (100%)

- SUSPECTS
  - Full description – ALL (100%)
  - Touched car and where - A2, B2, C2, C1, D1, D2 (67%)
  - Tried to open car – A2, B2, C2, D2, B1 (56%)
  - Acting suspicious / behaviour showing they are not 'just present' at scene/ did they take anything / were looking around / touching other cars (and where) – A2, C2, D2, B1, C1, B2 (67%)
  - Speech – A2, B2, C2, D2, B1, C1, D1 (78%)
  - Where suspects came from / went to – A2, B2, C2, B1, C1, E1 (67%)
  - *Were suspects in view the whole time B2, C1*
  - *Were they together – C2, E1*
  - Did they have tools – B2, E1, C1, D2 (44%)

- WITNESSES
  - Guy with son – A2, B2, A1, D1, D2, B1 (67%)
  - Girl with bike – A2, C2, A1, D1, E1, D2, B1 (78%)
  - *Guy getting into car at back (and his car) – B2, D2, B1*
  - Guy in the boot (and his car) – B2, C2, C1, D2, B1 (56%)
  - *Lady with red top who walked by first – A1, D2, B1*
  - Full descriptions of witness mentioned, including where they came from and went to – A2, B2, D2, B1, E1, C2 (67%)

- REACTION OF WITNESS (CAR OWNER) – A2, C2, D2, C1 (44%)

- VEHICLE THEY BROKE INTO
  - *Description of – C2, A1*
  - Vehicle left insecure? – C2, but also mentioned in Performance Aid

- SURROUNDINGS
  - *Alleyways off car park – C2*
  - *Where witness was in relation to car – D2*
  - *How full car park was – C1*

- *officers who think that all witnesses are equally important – D2, B1*
- *officers who think that none of the other witnesses are really that important – C1*

[1] Following each point is a list of officers who deemed the point important (i.e., officers C2 and A1 thought that a description of the target vehicle was important). Points for which agreement was less than 44% (i.e., points that only 1, 2, or 3 of the 9 officers mentioned) were not used to construct the 'Relevant Information' coding template (Appendix V). These omitted points are italicised.

<u>Appendix S</u>

Coding template, showing the details considered forensically important ('relevant') and not important ('peripheral') by officers.

A) Relevant Information

Characters:

- Girl with Bike (1-P)
  - her bike (1-O): green (1-O), boy's (1-O) mountain (1-O) bike
  - Caucasian (1-P) female (1-P)
  - in 20s (1-P)
  - glasses (1-P)
  - shoulder length (1-P) straight (1-P) dark brown/brown (1-P) hair with fringe (1-P), can't see her ears/hair worn loose/not pulled back (1-P)
  - wearing a black (1-P) sleeveless (1-P) top with rounded neckline (1-P)
  - long (1-P) dark brown/brown (1-P) skirt (1-P) with slit (1-P)
  - shoes are tan coloured (1-P) and flat (1-P), no socks/stockings (1-P)
  - black (1-P) bag (1-P) over left shoulder (1-P), has a white flash on it (1-P)
  - 5 ft 7 to 9 (1-P)

- Man with Child (1-P)
  - male (1-P)
  - dark skinned/Indian (1-P)
  - short (1-P) black (1-P) hair that is greying (1-P)
  - yellow (1-O) umbrella (1-O) in left hand (1-P)
  - jeans (1-P)
  - dark shoes (1-P)
  - dark coloured (1-P) fleecy/cloth (1-P) jacket (1-P) that goes just below waist (1-P), jacket is open (1-P)
  - stocky (1-P)
  - aged 40 to 50 (1-P)
  - 5 ft 5 to 8 (1-P)

- Child (1-P)
  - height: up to father's elbow (1-P)
  - male (1-P)
  - dark skinned/Indian (1-P)
  - short (1-P) black (1-P) hair
  - aged 5 to 10 (1-P)
  - white (1-P) t-shirt/short sleeved shirt (1-P) with logo/writing on it (1-P)
  - dark (1-P) trousers (1-P)
  - light/white (1-P) trainers (1-P)
  - object (1-O) in left hand (1-P)

- Man in boot of car (1-P)
  - man (1-P), Caucasian (1-P)
  - dark (1-P) top (1-P)
  - tan/beige (1-P) trousers (1-P)
  - dark shoes (1-P)

- aged 30 to 45 (1-P)
- stocky (1-P)
- dark (1-P) short (1-P) hair

- Hooligan 1 - Graham (1-P)
  - shortest of the hooligans/ 5 ft 6 to 5 ft 8 (1-P)
  - male (1-P) Caucasian (1-P)
    black/dark blue (1-P) woolen (1-P) hat (1-P) with white logo on front (1-P), not pulled way down over face (1-P)
  - dark/blue (1-P) jacket (1-P) that goes to waist (1-P)
  - sunglasses (1-P, 1-P)
  - unshaven (1-P) – but score 'beard' as incorrect
  - later in video, can see that he has a blue (1-P) shirt like a t-shirt on under jacket and is wearing dark blue jeans (1-P)
  - lean/slim (1-P)
  - aged 20-30 (1-P)

- Hooligan 2 - Sue (1-P)
  - girl (1-P; but because it's difficult to tell that she's a girl because of her costume, score as correct if the participant says that they thought it *might* be a girl at any point in the interview)
  - black (1-P) floppy (1-P) 70's style (1-P) hat (1-P) with peak (1-P)
  - height 5 ft 6 to 8 (1-P)
  - Caucasian (1-P)
  - black (1-P) leather (1-P) jacket (1-P) with belt (1-P), ¾ length (1-P), is not done up (1-P)
  - red (1-P) trousers/jeans (1-P)
  - black shoes (1-P)
  - blue/dark (1-P) shirt
  - late 20s to early 30s (1-P)
  - slim (1-P)

- Hooligan 3- James (1-P)
  - taller than other hooligans, about 6 ft (1-P)
  - hair is short (1-P) and dark brown/brown/black (1-P)
  - male (1-P) Caucasian (1-P)
  - black (1-P) leather (1-P) jacket (1-P) that is open (1-P)
  - white (1-P) shirt with collar (1-P)
  - jeans (1-P)
  - black/brown belt (1-P)
  - sunglasses (1-P, 1-P)
  - side burns (1-P)
  - shoes are dark brown/black (1-P) and have a bit of a heel (1-P)
  - slim/well-built/muscular (1-P)
  - aged 25 to 35 (1-P)
  - no hat (1-P)
  - clean shaven (1-P)

Setting and car descriptions:

- parking lot (1-S)

- trees and bushes (1-S) around edges (1-S)
- bright day, no rain (1-S)
- 2 rows of cars (2-S), another row to the far left (1-S)

- camera angle
  - people were too far away to see facial features clearly (1-S)
  - camera concentrated on one row of cars (1-S)

- maroon (1-O) car (1-O)
  - in foreground (1-S), to the right (1-S)

- on far side of the red car (1-S) is a gold/cream/white (1-O) car (1-O)

- on far side of gold car (1-S) is another car (1-O)
  - barely visible (1-S)

- in second row of cars: silver/blue (1-O) car (1-O)
  - closest to camera (1-S)
  - is sort of on it's own (1-S), empty space (1-S) on the right (1-S)

- on far side of blue car (1-S) is a red (1-O) car (1-O)

- dark green/black (1-O) car (1-O)
  - is on the other side of road to the left (1-S)
  - only car in the row (1-O)
  - car facing left (1-S)
  - has boot up (1-O) for the last part of film (1-O)
  - 4 door (1-O)

- roadways
  - pathway/road (1-S) in front of video camera (1-S), runs parallel to the side of cars (1-S)

- other stuff
  - not much sound/conversation (1-S)

Action Sequences (in detail) and Dialogue:

- three hooligans/car thieves (1-P) walk (1-A) towards the camera (1-S)
  - are on the right side of screen (1-S)
  - visible immediately when video starts (1-S)
  - James is on the far right (1-S)
  - Graham is in the middle (1-S)
  - Sue is on the left (1-S)

- Sue (1-P) walks over to (1-A) the far side of the gold car (1-S)

- Graham (1-P) looks at (1-A) license plate/back of (1-O) gold car (1-O)
  - he (1-P) looks in (1-A) window (1-O) on near side (1-S)

- James (1-P) goes to (1-A) the far side of maroon car (1-S)
  - he (1-P) tries (1-A) the door (1-O)

- Graham (1-P) leaves the screen (1-A) to the left (1-S)
  - James (1-P) follows (1-A)

- Graham (1-P) comes back on screen (1-A)

- Sue (1-P) checks out (1-A) the red car (1-O)

- Graham (1-P) tries (1-A) the back of red car (1-O)

- Graham and James (1-P) walk around (1-A) blue car (1-O)
  - Graham (1-P) goes off screen again (1-A)
  - he (1-P) comes back shortly (1-A)

- James (1-P) standing on the near side of blue car (1-S)
  - he (1-P) tries (1-A) door handle of blue car (1-O)

- Graham and Sue (1-P) leave the screen (1-A) to the right (1-S)

- James (1-P) touches (1-A) back of blue car (1-S)

- Sue (1-P) comes on screen (1-A) from the right (1-S) and she (1-P) walks to (1-A) red car again (1-O)
  - James (1-P) joins her (1-A)

- Girl (1-P) walks on screen (1-A) from right to left (1-S)
  - she (1-P) is pushing (1-A) a bike (1-O)
  - she (1-P) doesn't stop (1-A)

- James (1-P) turns around (1-A)
  - he (1-P) shouts (1-A) at her (1-P) "what are you (1-P) looking at (1-A)"
  - he (1-P) raises an arm (1-A)
  - Girl (1-P) ducks her head (1-A), she (1-P) sort of looks (1-A) at him (1-P) and she follows the parking lot road (1-S) until she disappears around corner (1-S)

- James and Sue (1-P) watch (1-A) Girl (1-P) leave then they (1-P) walk around (1-A) blue car again (1-O)
  - James (1-P) touches (1-A) it's boot (1-O)

- Graham (1-P) re-enters (1-A) from the right (1-S)
  - Sue and James (1-P) are inspecting (1-A) the boot of maroon car (1-O)

- Man and son (1-P) walk past (1-A) camera from right to left (1-S)
  - they (1-P) seem to be talking (1-A)
  - before they are flush with the bonnet of the blue car (1-S), Child (1-P) drops something (1-A)

- both (1-P) crouch down (1-A) with their backs to camera (1-S) to pick it up (1-A)
- they (1-P) get up (1-A)
- they (1-P) walk away (1-A)
- they (1-P) didn't go over to (1-A) the cars (1-O), were in the foreground (1-S)
- he (1-P) didn't seem to notice (1-A) them (1-P)
- boy (1-P) was on far side (1-S), he (1-P) was holding (1-A) Man's (1-P) right (1-P) hand (1-P)

- Graham (1-P) goes to (1-A) blue car (1-O)
  - he (1-P) moves off screen (1-A)

- Sue and James (1-P) move to (1-A) blue car (1-O)
  - James (1-P) kicks (1-A) tire (1-O)
  - he (1-P) throws up arms (1-A)

- Graham (1-P) enters (1-A) from left (1-S)
  - he (1-P) walks up to (1-A) driver's (1-O) door (1-O) of blue car (1-O)
  - he (1-P) walks away (1-A)

- can see Man in Boot in his boot
  - he (1-P) doesn't notice (1-A) them (1-P)
  - he's (1-P) doing things (1-A)

- Sue (1-P) tries (1-A) blue car (1-O) door (1-O)

- Sue and James (1-P) stand around (1-A) blue car (1-O)
  - one is on right (1-S), one is on left (1-S) of it
  - Graham (1-P) rolls up (1-A) sleeve (1-P), he (1-P) puts (1-A) arm (1-P) in window (1-O)
  - James (1-P) leans on (1-A) car (1-O)

- Owner Lady and Owner Man (1-P) walk in (1-A) towards the camera (1-S) from around corner (1-S)
  - they (1-P) break into a run (1-A) when they (1-P) see the hooligans (1-P) at their car (1-O)
  - Owner Lady (1-P) is screaming (1-A), she (1-P) has her hands (1-P) up to (1-A) her face (1-P)
  - Owner Man (1-P) shouts (1-A) "oi! Get away from (1-A) out car (1-O)"
  - hooligans (1-P) see (1-A) owners (1-P), hooligans (1-P) run (1-A)

- Sue and James run off screen to the right (1-S, 1-S), Graham runs off left (1-S)

- Owner Man (1-P) chases (1-A) Graham (1-P)
  - Owner Lady (1-P) goes to (1-A) driver's door (1-O)

- Owner Lady (1-P) is wailing (1-A) "look! Look! (1-A) what they (1-P) did (1-A)!"
  - Fiona (1-P) comforts (1-A) her (1-P)

- Owner Man (1-P) returns (1-A) from the left (1-A)
  - they (1-P) look at (1-A) the car (1-O)
  - they (1-P) talk (1-A)
  - they (1-P) stand (1-A) in front of driver's door (1-S)

- other
  - hooligans (1-P) didn't seem to discuss it (1-A)
  - they (1-P) concentrated on (1-A) the blue car (1-O)
  - they (1-P) were checking to see if it's easy to get in (1-A)
  - James (1-P) was a lookout (1-A)
  - didn't use an implement (1-O)
  - no one (1-P) got hurt (1-A)
  - hooligans (1-P) didn't damage/get in (1-A) car (1-O)
  - no one (1-P) interfered (1-A)
  - hooligans (1-P) didn't have keys (1-O)

B) Peripheral Information

Characters:

- Lady with Umbrella (1-P)
  - short/chin-length (1-P), wavy (1-P) brown/light brown (1-P) hair
  - Caucasian (1-P), female (1-P)
  - glasses (1-P)
  - wearing a red (1-P) sleeveless (1-P) top/blouse that is tucked into (1-P) blue jeans (1-P)
  - belt (1-P)
  - watch/bracelet (1-P) on right arm (1-P)
  - black (1-P) bag (1-P) slung over left (1-P) shoulder (1-P), bag rests on right hip (1-P) – i.e. she is wearing it diagonally across body
  - umbrella (1-O) in left hand (1-P) that is green/black (1-O)
  - aged 40-50 (1-P)
  - height 5 ft 5 to 7 (1-P)

- Person who puts rubbish in bin (1-P)
  - Caucasian (1-P)
  - male (1-P)
  - school (1-P) bag (1-P)
  - black (1-P) t-shirt/short sleeved shirt (1-P) with writing/design on front (1-P)
  - dark (1-P) trousers (1-P)
  - short (1-P) brown (1-P) hair
  - aged 20 to 30 (1-P)

- Station wagon owner (1-P)
  - short (1-P) blonde/grey (1-P) hair
  - Caucasian (1-P) male (1-P)
  - dark (1-P) sports (1-P) jacket (1-P)
  - light coloured (1-P) shirt
  - grey/tan (1-P) trousers (1-P)

- white badge/name badge (1-P) on left lapel (1-P)
- carrying something (1-O) in left hand (1-P)
- thin/not plump (1-P)
- aged 50 to 60 (1-P)

- Owner Lady (1-P)
  - purple (1-P) ¾ length (1-P) jacket (1-P)
  - light coloured/white (1-P) blouse (1-P)
  - black (1-P) trousers (1-P)
  - black (1-P) bag (1-P) on right shoulder (1-P), so that bag sits on left hip (1-P) – i.e. bag is diagonal across body, bag had several pockets (1-P)
  - black shoes (1-P)
  - short (1-P) light brown/reddish (1-P) hair with fringe (1-P)
  - no hat (1-P)
  - female (1-P), Caucasian (1-P)
  - sunglasses (1-P, 1-P)
  - about 5 ft 3 to 5 (1-P)
  - aged 40 to 50 (1-P)
  - plumpish body build (1-P)

- Owner Man (1-P)
  - man (1-P), Caucasian (1-P)
  - about the same height as Owner Lady (1-P)
  - white (1-P) short-sleeved (1-P) shirt with collar (1-P), tucked into (1-P) beige/tan (1-P) trousers (1-P)
  - glasses (1-P)
  - light brown/brown (1-P) hair, moustache (1-P), no hat (1-P)
  - slim (1-P)
  - belt (1-P)
  - trainers (1-P)
  - aged 40 to 50 (1-P)

- Fiona (1-P)
  - light blue/white/cream (1-P) straw/sun (1-P) hat (1-P) with a rim all the way round it (1-P)
  - female (1-P) Caucasian (1-P)
  - slim (1-P)
  - taller them Owner Lady and Owner Man/ 5 ft 7 to 5 ft 9 (1-P)
  - long (1-P) straight (1-P) blonde (1-P) hair
  - blue (1-P) shirt with long sleeves, like a light a cardigan (1-P)
  - long (1-P) black (1-P) skirt (1-P)
  - black (1-P) sandals (1-P)
  - sunglasses (1-P, 1-P)
  - aged 25 to 35 (1-P)

Setting and car descriptions:

- parking lot (1-S)
  - white lines for parking spaces (1-S)
  - not square (1-S)
  - were just looking at the end/ a portion of it (1-S)

- clean (1-S)
- tar mac/pavement (1-S)
- red maple (1-S) tree (1-S) in front of blue car (1-S)
- seems to be Keyne's parking lot (1-S)
- no buildings visible (1-S)
- didn't appear to be in a city (1-S)
- no animals (1-S)
- white curb visible (1-S), no grass verge (1-S), not a road (1-S)
- no parking lot attendant (1-P)
- two lamp posts (1-S, 1-S) and garbage can (1-S)

- no lorries present (1-S)

- no cars (1-O) came (1-A) or drove away (1-A)

- all cars facing to the right (1-S)

- maroon car
  - 4 door (1-O)
  - like a Vauxhall (1-O)
  - not metallic/shiny red (1-O)
  - silver hubcaps (1-O)
  - empty space to it's right (1-S)

- gold/cream/white car
  - sedan-like (1-O)

- on far side of gold car (1-S) is another car (1-O)
  - barely visible (1-S)

- silver/blue car
  - small (1-O) hatchback (1-O)
  - 2 door (1-O)
  - 4 seater (1-O)
  - Puegoet 106 (3-O)
  - fairly new and clean (1-O)
  - nothing is visible in windows like coats, etc. (1-O)
  - door handles are vertical not horizontal (1-O)

- on far side of blue car is a red car
  - empty space (1-S) on the far side of red car (1-S)

- maroon (1-O) car/station wagon/little van (1-O)
  - 4 doors (1-O)
  - is on the far side of the red car from above (1-S)

- red (1-O) truck (1-O)
  - far side of maroon vehicle (1-S)
  - facing left (1-S)

- roadways
  - pathway/road (1-S) to the right (1-S), runs perpendicular to the front of cars (1-S)
  - pathway/road (1-S) curves around right (1-S) passing behind the cars in 2nd row (1-S)
  - pathway/road (1-S) turns a corner to the left (1-S)
  - more parking spaces around corner/behind (1-S)

- other stuff
  - could tell that video was enacted, not real life (1-S)
  - couldn't see number plates of cars because they were side-on (1-S)
  - cars were parked quite close to one another (1-S)

Action Sequences (in detail) and Dialogue:

- Sue walks over to the far side of the gold car, but can only see her head/she's obscured by gold car (1-S)

- Graham looks at license plate/back of gold car
  - he (1-P) walks (1-A) the near side of gold car (1-S)
  - he looks in window on near side
  - he (1-P) moves around to (1-A) the back of car (1-S)

- Graham leaves the screen to the left
  - James follows
  - James (1-P) walks under red maple tree (1-A)
  - he (1-P) has to duck his head (1-A)

- Sue (1-P) walks to (1-A) the red car (1-O)

- Lady (1-P) walks past (1-A)
  - from left to right (1-S) in foreground (1-S)
  - she (1-P) looks at (1-A) the hooligans (1-P)
  - she (1-P) doesn't hesitate/keeps going (1-A)

- James moves to back of blue car
  - he (1-P) touches it (1-A) with right hand (1-P)
  - he (1-P) continues walking around (1-A) car in a clockwise direction (1-S)

- Girl walks on screen from right to left
  - she is pushing a bike
  - mostly just see her back (1-S)
  - no hand signals (1-A)

- she doesn't stop

- Graham re-enters from the right
  - he walks around red car
  - Sue and James are inspecting (the boot of maroon car

- Bin person (1-P) walks on (1-A) from around the corner (1-S) (i.e. from the left, where Charity exited)
  - he (1-P) throws (1-A) some rubbish in the bin (1-A)
  - he (1-P) walks off (1-A) to the right (1-S)
  - in the background (1-S)
  - he (1-P) didn't notice (1-A) them (1-P)

- Graham enters from left
  - he (1-P) adjusts (1-A) woolly hat (1-P)
  - he walks up to driver's door of blue car
  - he walks away

- Sue (1-P) tries (1-A) blue car (1-O) door (1-O)

- station wagon owner (1-P) walks to (1-A) the maroon station wagon (1-O)
  - comes from the left of screen, near camera (1-S)
  - he (1-P) opens the door (1-A)
  - he (1-P) puts something inside (1-A)
  - he (1-P) closes door (1-A)
  - he (1-P) makes sure door is locked (1-A)
  - he (1-P) walks back (1-A) to where he came from (1-S)

- Owner Lady and Owner Man walk in towards the camera from around corner
  - Owner Man is a bit behind Owner Lady (1-S)
  - they break into a run when they see the hooligans (at their car
  - Owner Lady is screaming, she has her hands up to her face
  - Owner Man shouts "oi! Get away from out car"
  - he (1-P)didn't cry (1-A)
  - hooligans see owners, hooligans run

- Fiona (1-P) enters from (1-A) the right (1-S)
  - she (1-P) goes to (1-A) Owner Lady (1-P) who is wailing (1-A) "look! Look! (1-A) what they (1-P) did (1-A)!"
  - Fiona (1-P) gives Owner Lady (1-P) a wee hug (1-A)
  - Owner Lady (1-P) reaches into (1-A) bag (1-P)

- Owner Man returns from the left
  - they look at the car
  - they talk
  - they stand in front of driver's door
  - Owner Man (1-P) holds (1-A) Owner Lady's (1-P) arms (1-P)
  - they (1-P) don't open (1-A) door (1-O)

- other - no police (1-P) came (1-A)

Appendix T

Results observed when the interviews from Study 2 were re-coded using a coding system that reflected the forensic relevance of information.

T.1 -Are Interview Duration and the Number of Questions asked in an interview covariates of recall?

Six ANOVAs, examining participants' recall of correct relevant, correct peripheral, incorrect relevant, incorrect peripheral, confabulated relevant, and confabulated peripheral details across the entire interview were conducted. *Age* and *Interview* Type were used as independent variables. *Interview Duration* and *Number of Questions* were included as covariates. As can be seen from Table T.1, only Interview Duration was a covariate for each type of recall. Consequently, *Interview Duration,* but not *Number of Questions,* was included as a covariate in all subsequent analyses.

Table T.1

Showing the results of ANOVAs performed to determine whether Interview Duration and Number of Questions asked are covariates.

	F	MSE	p	η_p^2
RELEVANT				
Correct				
Duration	$F(1, 143) = 57.46$	697.44	0.001*	0.29
Questions	$F(1, 143) = 0.26$	697.44	0.61	-
Incorrect				
Duration	$F(1\ 143) = 20.43$	23.39	0.001*	0.13
Questions	$F(1, 143) = 0.04$	23.39	0.83	-
Confabulated				
Duration	$F(1, 143) = 3.16$	3.92	0.08	-
Questions	$F(1, 143) = 0.02$	3.92	0.98	-
PERIPHERAL				
Correct				
Duration	$F(1, 143) = 50.28$	168.54	0.001*	0.26
Questions	$F(1, 143) = 0.96$	168.54	0.33	-
Incorrect				
Duration	$F(1, 143) = 9.11$	16.92	0.003*	0.06
Questions	$F(1, 143) = 0.55$	16.92	0.46	-
Confabulated				
Duration	$F(1, 143) = 6.89$	8.85	0.01*	0.05
Questions	$F(1, 143) = 0.001$	8.85	0.98	-

Note. Significant results are marked with an asterisk.

T.2 – Recall of Relevant and Peripheral Information

The mean (Tables T.2 – T.6) and adjusted mean (Table T.7) number of correct relevant, correct peripheral, incorrect relevant, incorrect peripheral, confabulated relevant, and confabulated peripheral details reported by participants in each interview phase was calculated. A series of 3 (age) x 3 (interview) ANCOVAs using *Interview Duration* as a covariate, were performed on the total number of correct, incorrect and confabulated relevant and peripheral details reported by participants. The main and interaction effects for these ANCOVAs are summarized in Tables T.8 (for Relevant Information) and T.9 (for Peripheral Information). Tukey's HSD post-hoc comparisons were conducted to investigate significant differences between conditions. Table T.10 summarizes the results of these post-hoc comparisons. From Table T.10, it can be seen that the original coding scheme used in Study 2 and the coding scheme consisting of forensically relevant information result in very similar age and interview effects (14 of 18 comparisons are the same).

Table T.2

*Mean number of correct, incorrect relevant and confabulated details of the Relevant and Peripheral type reported in the **Entire Interview** as a function of age and interview type (Standard Deviation1s in brackets). Means are **unadjusted** for the covariate Interview Duration.*

	CORRECT		INCORRECT		CONFABULATED	
	Relevant	Peripheral	Relevant	Peripheral	Relevant	Peripheral
Young						
Structured	113.76 (16.73)	32.29 (10.53)	8.24 (3.83)	5.35 (3.26)	0.82 (1.07)	0.47 (0.80)
Modified	145.35 (34.02)	46.41 (19.05)	9.76 (4.41)	6.65 (6.24)	1.12 (2.06)	0.82 (1.13)
Enhanced	163.88 (30.01)	51.12 (13.56)	8.12 (3.72)	6.18 (4.13)	1.18 (1.51)	1.18 (1.29)
Total	141.00 (34.42)	43.27 (16.60)	8.71 (3.99)	6.06 (4.65)	1.04 (1.57)	0.82 (1.11)
Young-old						
Structured	106.44 (22.71)	33.00 (13.90)	11.61 (5.67)	7.50 (3.29)	2.56 (3.94)	4.11 (7.15)
Modified	140.47 (39.40)	37.71 (20.71)	14.12 (6.89)	7.71 (3.24)	0.82 (1.24)	1.47 (1.75)
Enhanced	158.00 (35.89)	47.29 (17.90)	11.29 (4.09)	7.88 (5.68)	0.94 (1.14)	1.18 (3.19)
Total	134.42 (39.20)	39.21 (18.32)	12.33 (5.70)	7.69 (4.13)	1.46 (2.59)	2.29 (4.79)
Old-old						
Structured	71.88 (24.34)	16.29 (12.41)	9.71 (6.88)	5.35 (4.03)	1.18 (1.67)	0.88 (2.45)
Modified	88.35 (27.18)	19.41 (9.19)	8.71 (4.81)	4.59 (3.71)	0.82 (1.81)	0.53 (1.07)
Enhanced	103.24 (41.07)	24.59 (13.63)	8.53 (4.72)	4.35 (3.18)	1.12 (1.73)	1.24 (2.20)
Total	87.82 (33.66)	20.10 (12.15)	8.98 (5.47)	4.76 (3.61)	1.04 (1.71)	0.88 (1.98)
Total						
Structured	97.54 (27.94)	27.31 (14.41)	9.88 (5.67)	6.10 (3.62)	1.54 (2.65)	1.87 (4.67)
Modified	124.73 (42.22)	34.51 (20.24)	10.86 (5.87)	6.31 (4.68)	0.92 (1.71)	0.94 (1.38)
Enhanced	141.71 (44.73)	41.00 (18.98)	9.31 (4.35)	6.14 (4.60)	1.08 (1.45)	1.20 (2.31)

Table T.3

Mean number of correct, incorrect relevant and confabulated details of the Relevant and Peripheral type reported in the ***free recall phase*** *as a function of age and interview type (Standard Deviations in brackets). Means are* ***unadjusted*** *for the covariate Interview Duration.*

	CORRECT		INCORRECT		CONFABULATED	
	Relevant	Peripheral	Relevant	Peripheral	Relevant	Peripheral
Young						
Structured	61.00 (15.49)	7.41 (5.47)	2.59 (2.06)	0.47 (1.07)	0.47 (0.72)	0.12 (0.49)
Modified	95.59 (25.96)	16.12 (10.06)	3.24 (3.42)	0.59 (1.06)	0.65 (1.12)	0.12 (0.49)
Enhanced	110.12 (24.60)	18.76 (10.26)	2.82 (2.43)	1.24 (0.97)	0.41 (0.71)	0.29 (0.59)
Total	88.90 (30.32)	14.10 (9.98)	2.88 (2.66)	0.76 (1.07)	0.51 (0.86)	0.18 (0.52)
Young-old						
Structured	63.22 (22.42)	12.22 (11.3)	3.28 (2.30)	0.83 (1.10)	1.00 (1.75)	0.89 (2.27)
Modified	96.76 (32.72)	14.06 (12.91)	5.47 (4.29)	1.06 (1.56)	0.18 (0.53)	0.88 (1.87)
Enhanced	108.76 (26.35)	19.00 (10.41)	4.12 (2.29)	2.24 (3.85)	0.18 (0.53)	0.29 (0.67)
Total	89.08 (33.26)	15.04 (11.74)	4.27 (3.16)	1.37 (2.49)	0.46 (1.16)	0.69 (1.74)
Old-old						
Structured	34.41 (13.18)	4.59 (6.80)	1.29 (1.21)	0.65 (1.32)	0.47 (1.18)	0.24 (0.97)
Modified	51.29 (15.89)	6.29 (6.57)	2.88 (2.89)	0.29 (0.59)	0.53 (1.33)	0.35 (0.86)
Enhanced	66.59 (28.05)	7.65 (7.25)	3.18 (2.88)	1.29 (2.23)	0.53 (1.01)	0.94 (2.30)
Total	50.76 (23.76)	6.18 (6.86)	2.45 (2.55)	0.75 (1.56)	0.51 (1.16)	0.51 (1.53)
Total						
Structured	53.08 (21.70)	8.15 (8.79)	2.40 (2.06)	0.65 (1.15)	0.65 (1.30)	0.42 (1.49)
Modified	81.22 (33.11)	12.16 (10.85)	3.86 (3.69)	0.65 (1.16)	0.45 (1.05)	0.45 (1.24)
Enhanced	95.16 (32.93)	15.14 (10.67)	3.37 (2.55)	1.59 (2.62)	0.37 (0.77)	0.51 (1.43)

Table T.4

*Mean number of correct, incorrect relevant and confabulated details of the Relevant and Peripheral type reported in the **questioning phase** as a function of age and interview type (Standard Deviations in brackets). Means are **unadjusted** for the covariate Interview Duration.*

	CORRECT		INCORRECT		CONFABULATED	
	Relevant	Peripheral	Relevant	Peripheral	Relevant	Peripheral
Young						
Structured	52.76 (17.50)	24.88 (7.84)	5.65 (3.35)	4.88 (2.98)	0.35 (0.86)	0.35 (0.70)
Modified	49.76 (16.24)	30.29 (12.00)	6.24 (3.56)	6.12 (5.53)	0.47 (1.28)	0.65 (0.99)
Enhanced	53.71 (14.82)	32.41 (8.55)	5.29 (2.93)	4.94 (4.05)	0.76 (1.15)	0.88 (1.36)
Total	52.08 (15.98)	29.20 (9.97)	5.73 (3.25)	5.31 (4.27)	0.53 (1.10)	0.63 (1.06)
Young-old						
Structured	43.22 (17.01)	20.78 (7.60)	8.78 (4.53)	6.67 (3.36)	1.56 (3.28)	3.33 (6.05)
Modified	43.71 (17.55)	23.65 (11.06)	8.76 (4.49)	6.65 (2.81)	0.65 (1.12)	0.59 (0.80)
Enhanced	49.24 (19.49)	28.29 (12.79)	7.18 (3.56)	5.71 (3.33)	0.65 (1.06)	0.94 (3.15)
Total	45.35 (17.88)	24.17 (10.90)	8.25 (4.21)	6.35 (3.15)	0.96 (2.12)	1.65 (4.13)
Old-old						
Structured	37.47 (16.35)	11.71 (8.21)	8.41 (6.46)	4.71 (3.26)	0.71 (1.31)	0.65 (1.54)
Modified	36.35 (16.65)	13.06 (5.36)	6.06 (4.01)	4.29 (3.29)	0.29 (0.59)	0.18 (0.39)
Enhanced	35.53 (17.03)	16.88 (7.98)	5.59 (2.85)	3.76 (2.73)	0.59 (1.00)	0.82 (2.04)
Total	36.45 (16.36)	13.88 (7.49)	6.69 (4.76)	4.25 (3.07)	0.53 (1.01)	0.55 (1.49)
Total						
Structured	44.46 (17.78)	19.15 (9.49)	7.63 (5.05)	5.44 (3.27)	0.88 (2.15)	1.48 (3.86)
Modified	43.27 (17.39)	22.33 (12.08)	7.02 (4.15)	5.69 (4.10)	0.47 (1.03)	0.47 (0.78)
Enhanced	46.16 (18.59)	25.86 (11.84)	6.02 (3.18)	4.80 (3.44)	0.67 (1.05)	0.88 (2.26)

Table T.7

*Mean number of correct, incorrect relevant and confabulated details of the Relevant and Peripheral type reported in the **Entire Interview** (Entire) and both interview phases, as a function of age and interview type (Standard Errors in brackets). Means are **ADJUSTED** for the covariate Interview Duration*

	CORRECT		INCORRECT		CONFABULATED	
	Relevant	Peripheral	Relevant	Peripheral	Relevant	Peripheral
ENTIRE						
Age						
Young	140.30 (3.69)	0.46 (0.12)	8.63 (0.68)	6.02 (0.58)	1.03 (0.28)	0.80 (0.42)
Young-old	122.18 (4.02)	0.44 (0.13)	10.94 (0.74)	6.92 (0.63)	1.23 (0.30)	1.75 (0.45)
Old-old	101.43 (4.10)	0.42 (0.13)	10.47 (0.75)	5.59 (0.64)	1.26 (0.31)	1.42 (0.46)
Interview						
Young	104.36 (3.77)	0.56 (0.12)	10.62 (0.69)	6.49 (0.59)	1.63 (0.28)	2.09 (0.42)
Young-old	124.51 (3.69)	0.45 (0.12)	10.84 (0.68)	6.30 (0.58)	0.92 (0.28)	0.93 (0.42)
Old-old	135.05 (3.79)	0.31 (0.12)	8.59 (0.69)	5.73 (0.59)	0.97 (0.29)	0.94 (0.43)
FREE RECALL						
Age						
Young	88.39 (2.83)	13.92 (1.18)	2.85 (0.37)	0.75 (0.25)	0.51 (0.15)	0.16 (0.20)
Young-old	80.17 (3.09)	11.89 (1.28)	3.65 (0.40)	1.11 (0.27)	0.37 (0.16)	0.44 (0.21)
Old-old	60.78 (3.15)	9.58 (1.31)	3.13 (0.41)	1.03 (0.27)	0.60 (0.17)	0.77 (0.21)
Interview						
Young	58.03 (2.89)	9.83 (1.20)	2.74 (0.38)	0.80 (0.25)	0.69 (0.15)	0.55 (0.19)
Young-old	81.06 (2.83)	12.10 (1.18)	3.85 (0.37)	0.64 (0.25)	0.45 (0.15)	0.45 (0.19)
Old-old	90.26 (2.91)	13.47 (1.21)	3.04 (0.38)	1.45 (0.25)	0.33 (0.15)	0.38 (0.19)
QUESTIONING						
Age						
Young	51.90 (2.31)	29.05 (1.22)	5.69 (0.56)	5.29 (0.49)	0.52 (0.21)	0.61 (0.36)
Young-old	42.13 (2.52)	21.63 (1.33)	7.53 (0.61)	5.84 (0.54)	0.82 (0.23)	1.35 (0.39)
Old-old	39.92 (2.57)	16.66 (1.35)	7.44 (0.63)	4.79 (0.55)	0.67 (0.23)	0.84 (0.40)
Interview						
Young	46.27 (2.36)	20.55 (1.25)	8.00 (0.58)	5.69 (0.51)	0.94 (0.22)	1.59 (0.36)
Young-old	43.22 (2.31)	22.29 (1.22)	7.01 (0.56)	5.68 (0.49)	0.47 (0.21)	0.47 (0.36)
Old-old	44.60 (2.38)	24.50 (1.25)	5.65 (0.58)	4.54 (0.51)	0.60 (0.22)	0.74 (0.37)

Table T.8

Showing the main and interaction effects of ANCOVAs for correct, incorrect and confabulated Relevant Information recalled in each interview phase.

	Effect	F	MSE	p	η_p^2
CORRECT					
Entire	Age	$F(2, 143) = 24.99$	693.87	0.001*	0.29
	Interview	$F(2, 143) = 16.17$	693.87	0.001*	0.26
	Interaction	$F(2, 143) = 0.60$	693.87	0.67	-
Free Recall	Age	$F(2, 143) = 21.11$	408.60	0.001*	0.26
	Interview	$F(2, 143) = 31.23$	408.60	0.001*	0.30
	Interaction	$F(2, 143) = 0.50$	408.60	0.74	-
Questioning	Age	$F(4, 143) = 7.50$	272.98	0.001*	0.09
	Interview	$F(4, 143) = 0.43$	272.98	0.65	-
	Interaction	$F(4, 143) = 0.48$	272.98	0.75	-
INCORRECT					
Entire	Age	$F(2, 143) = 3.27$	23.23	0.04*	0.04
	Interview	$F(2, 143) = 3.16$	23.23	0.05*	0.04
	Interaction	$F(2, 143) = 0.32$	23.23	0.87	-
Free Recall	Age	$F(2, 143) = 1.08$	6.99	0.34	-
	Interview	$F(2, 143) = 2.42$	6.99	0.09	-
	Interaction	$F(2, 143) = 1.03$	6.99	0.39	-
Questioning	Age	$F(4, 143) = 3.42$	16.16	0.04*	0.04
	Interview	$F(4, 143) = 3.96$	16.16	0.02*	0.05
	Interaction	$F(4, 143) = 0.41$	16.16	0.80	-
CONFABULATED					
Entire	Age	$F(2, 143) = 0.21$	3.34	0.81	-
	Interview	$F(2, 143) = 1.92$	3.34	0.15	-
	Interaction	$F(2, 143) = 1.50$	3.34	0.21	-
Free Recall	Age	$F(2, 143) = 0.43$	1.13	0.65	-
	Interview	$F(2, 143) = 1.40$	1.13	0.25	-
	Interaction	$F(2, 143) = 1.40$	1.13	0.24	-
Questioning	Age	$F(4, 143) = 0.66$	0.47	0.62	-
	Interview	$F(4, 143) = 0.84$	1.29	0.28	-
	Interaction	$F(4, 143) = 1.14$	0.84	0.50	-

Note. Significant and marginally significant effects are marked with an asterisk.

Table T.9

Showing the main and interaction effects of ANCOVAs for correct, incorrect and confabulated ***Peripheral Information*** *recalled in each interview phase.*

	Effect	F	MSE	p	η_p^2
CORRECT					
Entire	Age	$F(2, 143) = 0.03$	0.70	0.98	-
	Interview	$F(2, 143) = 1.03$	0.70	0.36	-
	Interaction	$F(2, 143) = 0.78$	0.70	0.54	-
Free Recall	Age	$F(2, 143) = 3.07$	70.46	0.05*	0.04
	Interview	$F(2, 143) = 2.22$	70.46	0.11	-
	Interaction	$F(2, 143) = 0.97$	70.46	0.43	-
Questioning	Age	$F(4, 143) = 24.64$	75.70	0.001*	0.26
	Interview	$F(4, 143) = 2.38$	75.70	0.10	-
	Interaction	$F(4, 143) = 0.16$	75.70	0.96	-
INCORRECT					
Entire	Age	$F(2, 143) = 1.00$	16.87	0.37	-
	Interview	$F(2, 143) = 0.43$	16.87	0.65	-
	Interaction	$F(2, 143) = 0.19$	16.87	0.95	-
Free Recall	Age	$F(2, 143) = 0.58$	3.08	0.56	-
	Interview	$F(2, 143) = 2.85$	3.08	0.06*	0.04
	Interaction	$F(2, 143) = 0.30$	3.08	0.88	-
Questioning	Age	$F(4, 143) = 0.80$	12.44	0.45	-
	Interview	$F(4, 143) = 1.65$	12.44	0.20	-
	Interaction	$F(4, 143) = 0.13$	12.44	0.97	-
CONFABULATED					
Entire	Age	$F(2, 143) = 1.33$	8.79	0.27	-
	Interview	$F(2, 143) = 2.42$	8.79	0.09	-
	Interaction	$F(2, 143) = 2.08$	8.79	0.09	-
Free Recall	Age	$F(2, 143) = 2.34$	1.81	0.10	-
	Interview	$F(2, 143) = 0.18$	1.81	0.83	-
	Interaction	$F(2, 143) = 1.20$	1.81	0.31	-
Questioning	Age	$F(4, 143) = 1.00$	6.48	0.37	-
	Interview	$F(4, 143) = 2.58$	6.48	0.08	-
	Interaction	$F(4, 143) = 2.19$	6.48	0.07	-

Note. Significant and marginally significant effects are marked with an asterisk.

Table T.10

Summary of age and interview effects originally found in Study 2, and when relevant and peripheral information was considered separately.

	Original Coding	Relevant Details	Peripheral Details
AGE EFFECTS			
FR Correct	y > o > x	y > o > x	y , o > x
FR Incorrect	-	-	-
FR Confabulated	-	-	-
QP Correct	y > o , x	y > o , x	y > o > x
QP Incorrect	-	y < o , x	-
QP Confabulated	-	-	-
E Correct	y > o > x	y > o > x	-
E Incorrect	-	y < o , x	-
E Confabulated	-	-	-
INTERVIEW EFFECTS			
FR Correct	s < m < e	s < m < e	-
FR Incorrect	-	-	s , m < e *
FR Confabulated	-	-	-
QP Correct	-	-	-
QP Incorrect	s > m , e	s > m , e	-
QP Confabulated	s > m*	-	-
E Correct	s < m < e	s < m < e	-
E Incorrect	-	s , m > e	-
E Confabulated	s > m , e	-	-

Note. In this table, y = young adult, o = young-old adult, x = old-old adult, s = SI, m = MCI, e = ECI, '*' = marginally significant effect, '-' = no significant effect.

Appendix U

The Beck Depression Inventory-II (Beck et al., 1996).

This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the ONE statement in each group that best describes the way you have been feeling during the PAST TWO WEEKS, INCLUDING TODAY. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including questions P and R.

A)
1 I do not feel sad.
2 I feel sad much of the time.
3 I am sad all the time.
4 I am so sad or unhappy that I can't stand it.

B)
1 I am not discouraged about my future.
2 I feel more discouraged about my future than I used to be.
3 I do not expect things to work out for me.
4 I feel that my future is hopeless and will only get worse.

C)
1 I do not feel like a failure.
2 I feel I have failed more than I should have.
3 As I look back, I can see a lot of failures.
4 I feel I am a total failure as a person.

D)
1 I get as much pleasure as I ever did from the things I enjoy.
2 I don't enjoy things as much as I used to.
3 I get very little pleasure from the things I used to enjoy.
4 I can't get any pleasure from the things I used to enjoy.

E)
1 I don't feel particularly guilty.
2 I feel guilty over many things I have done or should have done.
3 I feel quite guilty most of the time.
4 I feel guilty all of the time.

F)
1 I don't feel I am being punished.
2 I feel I may be punished.
3 I expect to be punished.
4 I feel I am being punished.

G)
1 I feel the same about myself as ever.
2 I have lost confidence in myself.
3 I am disappointed with myself.
4 I dislike myself.

H)
1 I don't criticize or blame myself more than usual.
2 I am more critical of myself than I used to be.
3 I criticize myself for all of my faults.
4 I blame myself for everything bad that happens.

I) 1 I don't have any thoughts of killing myself.
2 I have thoughts of killing myself, but I would not carry them out.
3 I would like to kill myself.
4 I would kill myself if I had the chance.

J) 1 I don't cry any more than I used to.
2 I cry more than I used to.
3 I cry over every little thing.
4 I feel like crying, but I can't.

K) 1 I am no more restless or wound up than usual.
2 I feel more restless or wound up than usual.
3 I am so restless or agitated that it's hard to stay still.
5 I am so restless or agitated that I have to keep moving or doing something.

L) 1 I have not lost interest in other people or activities.
2 I am less interested in other people or things than before.
3 I have lost most of my interest in other people.
4 I have lost all of my interest in other people or things.

M) 1 I make decisions about as well as ever.
2 I find it more difficult to make decisions than usual.
3 I have much greater difficulty in making decisions than I used to.
4 I have trouble making any decisions.

N) 1 I do not feel I am worthless.
2 I do not consider myself as worthwhile and useful as I used to.
3 I feel more worthless as compared to other people.
4 I feel utterly worthless.

O) 1 I have as much energy as ever.
2 I have less energy than I used to have.
3 I don't have enough energy to do very much.
4 I don't have enough energy to do anything.

P) 1 I have not experienced any change in my sleeping pattern.
2 I sleep somewhat more than usual.
3 I sleep somewhat less than usual.
4 I sleep a lot more than usual.
5 I sleep a lot less than usual.
6 I sleep most of the day.
7 I wake up 1-2 hours early and can't get back to sleep.

Q) 1 I am no more irritable than usual.
2 I am more irritable than usual.
3 I am much more irritable than usual.
4 I am irritable all the time.

R) 1 I have not experienced any change in my appetite.
2 My appetite is somewhat less than usual.
3 My appetite is somewhat greater than usual.
4 My appetite is much less than before.
5 My appetite is much greater than usual.
6 I have no appetite at all.
7 I crave food all the time.

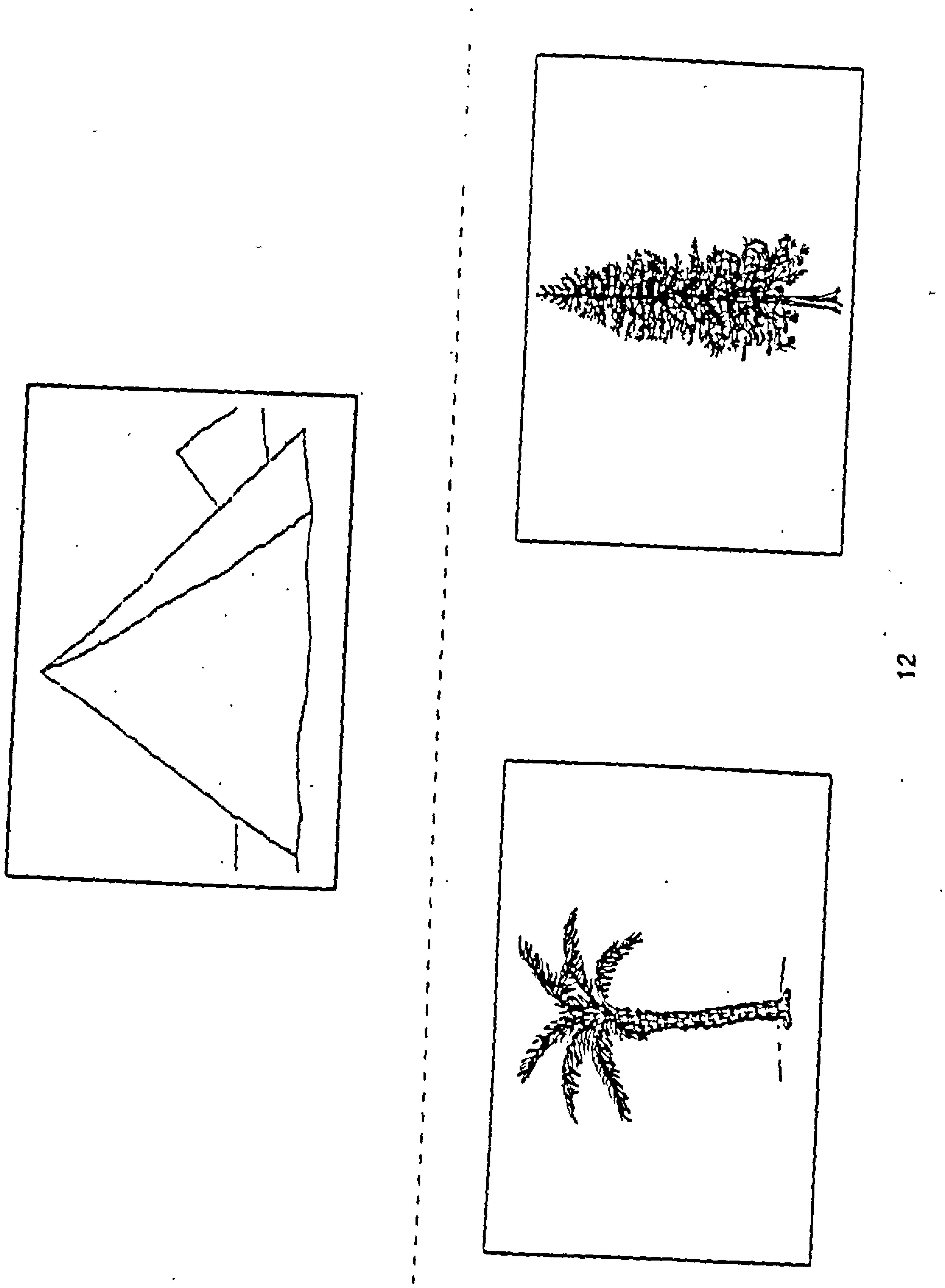
S) 1 I can concentrate as well as ever.
2 I can't concentrate as well as usual.
3 It's hard to keep my mind on anything for very long.
4 I find I can't concentrate on anything.

T) 1 I am no more tired or fatigued than usual.
2 I get tired or fatigued more easily than usual.
3 I am too tired or fatigued to do a lot of the things I used to do.
4 I am too tired or fatigued to do most of the things I used to do.

U) 1 I have not noticed any recent change in my interest in sex.
2 I am less interested in sex than I used to be.
3 I am much less interested in sex now.
4 I have lost interest in sex completely.

Appendix V

Example of a test trial from the Pyramids and Palm Trees Test
(Howard & Peterson, 1992).



Appendix W

Tables showing the non-significant results for Study 3 (Chapter V).

Table W.1

Non-significant results for gender analyses

	F	MSE	p
Total correct details	$F\,(1,98) = 0.18$	1885.52	0.67
Total incorrect details	$F\,(1,98) = 1.98$	43.18	0.16
Total confabulated details	$F\,(1,98) = 0.35$	6.42	0.56
Accuracy	$F\,(1,98) = 0.57$	0.002	0.45
Completeness	$F\,(1,98) = 0.18$	0.004	0.67

Table W.2

Non-Significant results for participant performance across the entire interview

	Detail Type	F	MSE	p
CORRECT				
Age	Action	$F\,(1, 92) = 2.26$	62.93	0.14
	Surrounding	$F\,(1, 92) = 0.18$	37.38	0.67
Interview	Action	$F\,(2, 92) = 1.24$	62.93	0.30
	Person	$F\,(2, 92) = 18.07$	369.92	0.08
	Surrounding	$F\,(2, 92) = 1.50$	37.38	0.25
Interaction	Action	$F\,(2, 92) = 2.32$	62.93	0.10
	Person	$F\,(2, 92) = 2.24$	369.92	0.11
	Object	$F\,(2, 92) = 0.33$	28.49	0.73
	Surrounding	$F\,(2, 92) = 1.05$	37.38	0.37
	Total	$F\,(2, 92) = 2.47$	975.93	0.09
INCORRECT				
Age	Action	$F\,(1, 92) = 0.40$	1.06	0.53
	Object	$F\,(1, 92) = 0.00$	1.42	0.99
	Total	$F\,(1, 92) = 1.17$	37.99	0.28
Interview	Surrounding	$F\,(2, 92) = 2.09$	1.44	0.13
Interaction	Action	$F\,(2, 92) = 0.55$	1.06	0.58
	Person	$F\,(2, 92) = 2.67$	24.31	0.08
	Object	$F\,(2, 92) = 0.06$	1.42	0.94
	Surrounding	$F\,(2, 92) = 0.18$	1.44	0.84
	Total	$F\,(2, 92) = 2.21$	37.99	0.12
CONFABULATED				
Age	Action	$F\,(1, 92) = 0.24$	0.23	0.63
	Person	$F\,(1, 92) = 0.83$	4.30	0.37
	Object	$F\,(1, 92) = 0.16$	0.33	0.69
	Total	$F\,(1, 92) = 1.77$	5.64	0.19
Interview	Action	$F\,(2, 92) = 0.23$	0.23	0.80
	Surrounding	$F\,(2, 92) = 0.12$	0.33	0.88
	Object	$F\,(2, 92) = 2.83$	0.33	0.07
Interaction	Action	$F\,(2, 92) = 0.94$	0.23	0.39
	Person	$F\,(2, 92) = 1.37$	4.30	0.26
	Object	$F\,(2, 92) = 0.86$	0.33	0.69
	Total	$F\,(2, 92) = 2.37$	5.64	0.10

Table W.3
Non-significant results for participant performance in the free recall phase

	Detail Type	F	MSE	p
CORRECT				
Age	Action	$F(1, 92) = 2.15$	43.97	0.15
	Object	$F(1, 92) = 1.89$	18.74	0.17
	Surrounding	$F(1, 92) = 1.16$	21.99	0.28
	Total	$F(1, 92) = 3.32$	491.10	0.07
Interaction	Object	$F(2, 92) = 1.42$	18.74	0.25
	Surrounding	$F(2, 92) = 0.62$	21.99	0.54
INCORRECT				
Age	Action	$F(1, 92) = 1.39$	0.69	0.16
	Person	$F(1, 92) = 0.32$	3.31	0.57
	Object	$F(1, 92) = 0.19$	1.23	0.66
	Surrounding	$F(1, 92) = 0.47$	0.37	0.50
	Total	$F(1, 92) = 1.19$	7.15	0.28
Interview	Action	$F(2, 92) = 1.86$	0.69	0.24
	Person	$F(2, 92) = 0.31$	3.31	0.73
	Object	$F(2, 92) = 1.18$	1.23	0.31
	Surrounding	$F(2, 92) = 1.55$	0.37	0.22
	Total	$F(2, 92) = 0.65$	7.15	0.52
Interaction	Action	$F(2, 92) = 0.41$	0.69	0.67
	Person	$F(2, 92) = 1.15$	3.31	0.32
	Object	$F(2, 92) = 0.23$	1.23	0.79
	Surrounding	$F(2, 92) = 1.52$	0.37	0.22
	Total	$F(2, 92) = 1.86$	7.15	0.16
CONFABULATED				
Age	Action	$F(1, 92) = 0.11$	0.12	0.74
	Person	$F(1, 92) = 0.53$	0.68	0.47
	Object	$F(1, 92) = 0.03$	0.09	0.87
	Surrounding	$F(1, 92) = 0.17$	0.07	0.69
	Total	$F(1, 92) = 0.15$	1.23	0.70
Interview	Action	$F(2, 92) = 0.45$	0.12	0.64
	Object	$F(2, 92) = 0.30$	0.09	0.79
	Surrounding	$F(2, 92) = 0.32$	0.07	0.74
Interaction	Action	$F(2, 92) = 0.83$	0.12	0.44
	Person	$F(2, 92) = 0.45$	0.68	0.64
	Object	$F(2, 92) = 0.77$	0.09	0.47
	Surrounding	$F(2, 92) = 2.87$	0.07	0.07
	Total	$F(2, 92) = 0.80$	1.23	0.45

Table W.4

Non-significant results for participant performance in the questioning phase

	Detail Type	F	MSE	p
CORRECT				
Age	Action	$F(1, 92) = 0.01$	9.59	0.94
	Object	$F(1, 92) = 1.83$	12.74	0.18
Interview	Person	$F(2, 92) = 0.80$	183.77	0.45
	Object	$F(2, 92) = 0.66$	12.74	0.52
	Surrounding	$F(2, 92) = 0.21$	20.69	0.81
	Total	$F(2, 92) = 0.87$	358.48	0.42
Interaction	Person	$F(2, 92) = 0.30$	183.77	0.74
	Object	$F(2, 92) = 0.73$	12.74	0.49
	Surrounding	$F(2, 92) = 0.81$	20.69	0.45
INCORRECT				
Age	Action	$F(1, 92) = 0.20$	0.28	0.65
	Object	$F(1, 92) = 0.13$	1.12	0.72
Interview	Surrounding	$F(2, 92) = 2.65$	1.07	0.08
Interaction	Action	$F(2, 92) = 2.41$	0.28	0.10
	Object	$F(2, 92) = 0.39$	1.12	0.68
	Surrounding	$F(2, 92) = 1.32$	1.07	0.27
CONFABULATED				
Age	Action	$F(1, 92) = 0.12$	0.12	0.73
	Person	$F(1, 92) = 2.45$	3.30	0.12
	Object	$F(1, 92) = 0.07$	0.19	0.79
Interview	Action	$F(2, 92) = 1.73$	0.12	0.18
	Surrounding	$F(2, 92) = 0.56$	0.30	0.57
Interaction	Action	$F(2, 92) = 1.42$	0.12	0.25
	Person	$F(2, 92) = 0.46$	3.30	0.63
	Object	$F(2, 92) = 0.89$	0.19	0.89
	Surrounding	$F(2, 92) = 2.24$	0.30	0.11
	Total	$F(2, 92) = 0.88$	4.29	0.42

Table W.5

Non-significant results for accuracy and completeness scores

	Phase	F	MSE	p
ACCURACY				
Age	Free Recall	$F\,(1, 92) = 2.15$	0.001	0.15
	Questioning	$F\,(1, 92) = 0.16$	0.001	0.69
	Entire	$F\,(1, 92) = 0.62$	0.001	0.28
Interview	Free Recall	$F\,(2, 92) = 2.46$	0.001	0.09
Interaction	Free Recall	$F\,(2, 92) = 0.02$	0.001	0.98
COMPLETENESS				
Age	Free Recall	$F\,(1, 92) = 3.32$	0.001	0.07
Interview	Questioning	$F\,(2, 92) = 0.87$	0.001	0.42
Interaction	Questioning	$F\,(2, 92) = 0.50$	0.001	0.61
	Entire	$F\,(2, 92) = 2.47$	0.002	0.09

Appendix X
Unadjusted means for Study 3 (Chapter V)

Table X.1
Mean number of Action, Person, Object and Surrounding details recalled in the entire interview, as a function of age and interview type (standard deviations in brackets)

	Action	Person	Object	Surround	TOTAL
Correct					
Young					
SI	24.88 (7.09)	87.50 (23.81)	17.37 (6.19)	13.56 (6.20)	143.63 (37.31)
MCI	30.00 (6.88)	109.35 (17.80)	20.41 (5.97)	19.00 (4.54)	178.53 (30.55)
ECI	37.83 (10.62)	122.61 (27.94)	24.72 (5.68)	23.83 (11.04)	210.17 (49.29)
Total	31.16 (9.89)	107.18 (27.35)	20.98 (6.57)	19.00 (8.80)	178.75 (47.88)
Young-old					
SI	26.71 (7.56)	83.82 (18.14)	16.24 (5.35)	16.06 (4.52)	143.24 (30.53)
MCI	29.31 (8.56)	90.44 (21.34)	18.69 (4.18)	17.81 (6.18)	156.19 (33.58)
ECI	33.13 (10.81)	104.94 (17.25)	22.12 (5.18)	25.00 (9.04)	185.19 (32.51)
Total	29.65 (9.26)	92.88 (20.60)	18.96 (5.42)	19.55 (7.71)	161.16 (36.16)
Total					
SI	25.82 (7.28)	85.61 (20.83)	16.79 (5.71)	14.85 (5.46)	143.42 (33.44)
MCI	29.67 (7.64)	100.18 (21.54)	19.58 (5.17)	18.42 (5.35)	167.70 (33.52)
ECI	35.62 (10.82)	114.29 (24.85)	23.50 (5.52)	24.38 (10.02)	198.41 (43.50)
Incorrect					
Young					
SI	1.19 (1.28)	15.13 (5.14)	1.38 (1.15)	1.25 (1.61)	18.94 (7.03)
MCI	0.47 (0.80)	10.82 (3.86)	1.24 (1.44)	1.12 (0.93)	13.59 (5.54)
ECI	0.28 (0.58)	8.72 (5.03)	0.83 (0.86)	0.83 (0.92)	10.67 (4.95)
Total	0.63 (0.98)	11.43 (5.33)	1.14 (1.17)	1.06 (1.17)	14.24 (6.69)
Young-old					
SI					
MCI	1.18 (1.51)	10.47 (6.09)	1.35 (1.58)	1.71 (1.49)	14.71 (8.88)
ECI	0.50 (0.82)	8.56 (4.86)	1.25 (1.07)	1.94 (0.99)	12.25 (5.71)
Total	0.81 (0.98)	9.88 (4.27)	1.13 (1.09)	1.50 (1.16)	13.31 (4.19)
Total	0.84 (1.16)	9.65 (5.11)	1.24 (1.25)	1.17 (1.23)	13.45 (6.56)
SI					
MCI	1.18 (1.38)	12.73 (6.04)	1.36 (1.37)	1.48 (1.54)	16.76 (8.20)
ECI	0.48 (0.80)	9.73 (4.45)	1.24 (1.25)	1.52 (1.03)	12.94 (5.57)
	0.53 (0.83)	9.26 (4.65)	0.97 (0.97)	1.15 (1.08)	11.91 (4.73)
Confabulated					
Young					
SI	0.25 (0.58)	2.69 (2.87)	0.56 (0.89)	0.56 (0.63)	4.06 (3.19)
MCI	0.29 (0.69)	1.12 (1.45)	0.06 (0.24)	0.18 (0.53)	1.65 (1.80)
ECI	0.06 (0.24)	1.17 (2.26)	0.17 (0.38)	0.56 (0.86)	1.94 (2.58)
Total	0.20 (0.53)	1.63 (2.32)	0.25 (0.60)	0.43 (0.70)	2.51 (2.74)
Young-old					
SI	0.24 (0.56)	1.82 (2.72)	0.47 (0.80)	0.00 (0.00)	2.53 (3.00)
MCI	0.06 (0.25)	1.81 (1.76)	0.31 (0.48)	0.38 (0.50)	2.56 (2.10)
ECI	0.13 (0.34)	0.63 (0.81)	0.13 (0.34)	0.25 (0.58)	1.13 (1.15)
Total	0.14 (0.41)	1.43 (1.99)	0.31 (0.59)	0.20 (0.46)	2.08 (2.29)
Total					
SI	0.24 (0.56)	2.24 (2.78)	0.52 (0.83)	0.27 (0.52)	3.27 (3.15)
MCI	0.18 (0.53)	1.45 (1.62)	0.18 (0.39)	0.27 (0.52)	2.09 (1.97)
ECI	0.09 (0.29)	0.91 (1.73)	0.15 (0.36)	0.41 (0.74)	1.56 (2.05)

Table X.2

Mean number of Action, Person, Object and Surrounding details recalled in the free recall phase, as a function of age and interview type (standard deviations in brackets)

	Action	Person	Object	Surround	TOTAL
Correct					
Young					
SI	17.56 (5.83)	36.38 (10.76)	9.50 (3.25)	2.38 (1.50)	65.81 (17.24)
MCI	26.47 (6.49)	62.18 (14.91)	13.94 (4.13)	6.71 (3.02)	109.29 (21.80)
ECI	34.44 (10.15)	67.67 (21.09)	17.17 (6.61)	11.11 (7.48)	130.39 (41.59)
Total	26.49 (10.35)	56.02 (21.03)	13.69 (5.78)	6.90 (5.96)	103.10 (39.44)
Young-old					
SI	21.41 (6.26)	44.82 (11.81)	10.53 (4.19)	5.00 (3.00)	81.76 (22.43)
MCI	24.56 (8.33)	50.50 (13.35)	12.50 (3.62)	7.00 (6.19)	94.50 (26.05)
ECI	30.00 (6.55)	60.56 (12.58)	15.44 (4.55)	13.81 (7.49)	119.81 (24.23)
Total	25.24 (7.81)	51.82 (13.97)	12.78 (4.53)	8.53 (6.85)	98.35 (28.62)
Total					
SI	19.55 (6.27)	40.73 (11.93)	10.03 (3.74)	3.73 (2.71)	74.03 (21.36)
MCI	25.55 (7.38)	56.52 (15.16)	13.24 (3.90)	6.85 (4.74)	102.12 (24.74)
ECI	32.35 (8.81)	64.32 (17.72)	16.35 (5.72)	12.38 (7.49)	125.41 (34.45)
Incorrect					
Young					
SI	0.44 (0.63)	1.31 (1.30)	0.75 (2.27)	0.13 (0.50)	2.06 (1.69)
MCI	0.41 (0.71)	2.41 (1.87)	0.24 (0.56)	0.18 (0.39)	3.18 (2.19)
ECI	0.17 (0.51)	1.94 (1.63)	0.22 (0.55)	0.33 (0.77)	2.67 (2.11)
Total	0.33 (0.62)	1.90 (1.65)	0.39 (1.34)	0.22 (0.58)	2.65 (2.03)
Young-old					
SI					
MCI	0.82 (1.38)	2.24 (2.46)	0.47 (1.18)	0.53 (0.94)	4.06 (4.87)
ECI	0.44 (0.81)	2.00 (1.32)	0.13 (0.34)	0.13 (0.34)	2.69 (1.89)
Total	0.44 (0.63)	2.38 (2.13)	0.31 (0.48)	0.38 (0.50)	3.50 (2.13)
Total	0.57 (1.00)	2.20 (2.00)	0.31 (0.77)	0.35 (0.66)	3.43 (3.28)
SI					
MCI	0.64 (1.08)	1.79 (2.01)	0.61 (1.77)	0.33 (0.78)	3.09 (3.77)
ECI	0.42 (0.75)	2.21 (1.62)	0.18 (0.47)	0.15 (0.36)	2.94 (2.03)
Confabulated	0.29 (0.58)	2.15 (1.86)	0.26 (0.51)	0.35 (0.65)	3.06 (2.13)
Young					
SI	0.13 (0.50)	0.31 (0.79)	0.13 (0.34)	0.00 (0.00)	0.56 (1.21)
MCI	0.12 (0.49)	0.65 (0.93)	0.06 (0.24)	0.00 (0.00)	0.82 (1.07)
ECI	0.06 (0.24)	0.22 (0.55)	0.11 (0.32)	0.17 (0.51)	0.56 (1.29)
Total	0.10 (0.41)	0.39 (0.78)	0.10 (0.30)	0.06 (0.31)	0.65 (1.18)
Young-old					
SI	0.00 (0.00)	0.29 (0.77)	0.18 (0.39)	0.00 (0.00)	0.47 (0.80)
MCI	0.06 (0.25)	1.00 (1.16)	0.13 (0.34)	0.13 (0.34)	1.31 (1.30)
ECI	0.13 (0.34)	0.31 (0.60)	0.00 (0.00)	0.00 (0.00)	0.44 (0.81)
Total	0.06 (0.24)	0.53 (0.92)	0.10 (0.31)	0.04 (0.20)	0.73 (1.06)
Total					
SI	0.06 (0.35)	0.30 (0.77)	0.15 (0.36)	0.00 (0.00)	0.52 (1.00)
MCI	0.09 (0.38)	0.82 (1.04)	0.09 (0.29)	0.06 (0.24)	1.06 (1.20)
ECI	0.09 (0.29)	0.26 (0.57)	0.06 (0.24)	0.09 (0.38)	0.50 (1.08)

Table X.3

Mean number of Action, Person, Object and Surrounding details recalled in the questioning phase, as a function of age and interview type (standard deviations in brackets)

	Action	Person	Object	Surround	TOTAL
Correct					
Young					
SI	7.31 (2.98)	51.13 (17.21)	7.87 (3.70)	11.19 (5.48)	77.81 (24.26)
MCI	3.53 (3.02)	47.12 (13.03)	6.29 (3.82)	12.29 (3.37)	69.24 (18.19)
ECI	3.39 (2.57)	54.94 (16.13)	7.56 (3.96)	13.56 (7.03)	79.44 (22.83)
Total	4.67 (3.33)	51.14 (15.57)	7.24 (3.82)	12.39 (5.51)	75.53 (21.92)
Young-old					
SI	5.18 (3.61)	39.00 (11.50)	5.71 (3.35)	11.06 (3.34)	60.88 (14.78)
MCI	4.75 (2.86)	39.94 (12.39)	6.19 (2.48)	10.81 (3.83)	61.69 (16.66)
ECI	4.56 (3.37)	44.38 (9.68)	6.69 (3.75)	11.19 (3.83)	66.81 (15.48)
Total	4.84 (3.24)	41.06 (11.26)	6.18 (3.20)	11.02 (3.60)	63.08 (15.54)
Total					
SI	6.21 (3.44)	44.88 (15.58)	6.76 (3.64)	11.12 (4.44)	69.09 (21.42)
MCI	4.12 (2.97)	43.64 (13.04)	6.24 (3.19)	11.58 (3.62)	65.58 (17.61)
ECI	3.94 (2.98)	49.97 (14.33)	7.15 (3.83)	12.44 (5.80)	73.50 (20.45)
Incorrect					
Young					
SI	0.75 (0.86)	13.81 (5.23)	1.19 (1.17)	1.13 (1.36)	16.87 (6.60)
MCI	0.06 (0.24)	8.41 (3.69)	1.00 (1.06)	0.94 (0.90)	10.41 (4.27)
ECI	0.11 (0.32)	6.78 (4.22)	0.61 (0.78)	0.50 (0.62)	8.00 (4.13)
Total	0.29 (0.61)	9.53 (5.26)	0.92 (1.02)	0.84 (1.01)	11.59 (6.23)
Young-old					
SI	0.41 (0.62)	8.24 (4.76)	0.88 (1.41)	1.18 (0.83)	10.71 (5.63)
MCI	0.06 (0.25)	6.63 (4.30)	1.13 (1.03)	1.81 (0.83)	9.63 (5.01)
ECI	0.38 (0.62)	7.50 (3.76)	0.81 (0.98)	1.13 (1.26)	9.81 (3.62)
Total	0.29 (0.54)	7.47 (4.28)	0.94 (1.14)	1.37 (1.09)	10.06 (4.77)
Total					
SI	0.58 (0.75)	10.94 (5.67)	1.03 (1.29)	1.15 (1.20)	13.70 (6.79)
MCI	0.06 (0.24)	7.55 (4.04)	1.06 (1.03)	1.36 (0.96)	10.03 (4.59)
ECI	0.24 (0.49)	7.12 (3.97)	0.71 (0.87)	0.79 (1.01)	8.85 (3.95)
Confabulated					
Young					
SI	0.13 (0.34)	2.38 (2.80)	0.44 (0.73)	0.56 (0.63)	3.50 (3.12)
MCI	0.18 (0.53)	0.47 (0.94)	0.00 (0.00)	0.18 (0.53)	0.82 (1.33)
ECI	0.00 (0.00)	0.94 (2.24)	0.06 (0.24)	0.44 (0.78)	1.44 (2.33)
Total	0.10 (0.36)	1.24 (2.23)	0.16 (0.46)	0.39 (0.67)	1.88 (2.57)
Young-old					
SI	0.24 (0.56)	1.53 (2.21)	0.29 (0.59)	0.00 (0.00)	2.06 (2.54)
MCI	0.00 (0.00)	0.44 (0.89)	0.13 (0.34)	0.19 (0.40)	0.75 (1.24)
ECI	0.00 (0.00)	0.31 (0.60)	0.13 (0.34)	0.25 (0.58)	0.69 (0.95)
Total	0.08 (0.34)	0.78 (1.52)	0.18 (0.44)	0.14 (0.41)	1.18 (1.82)
Total					
SI	0.18 (0.47)	1.94 (2.51)	0.36 (0.65)	0.27 (0.52)	2.76 (2.88)
MCI	0.09 (0.38)	0.45 (0.91)	0.06 (0.24)	0.18 (0.47)	0.79 (1.27)
ECI		0.65 (1.67)	0.09 (0.29)	0.35 (0.69)	1.09 (1.83)

Table X.4

*Mean number of correct, incorrect and confabulated details recalled with **uncertainty**, as a function of age and interview (standard deviations in brackets)*

	Free Recall Phase	Questioning Phase	Entire Interview
Correct			
Young			
SI	0.13 (0.34)	0.87 (0.96)	1.00 (1.03)
MCI	0.12 (0.33)	1.24 (0.90)	1.35 (0.93)
ECI	0.33 (1.03)	0.61 (0.92)	0.94 (1.55)
Total	0.20 (0.66)	0.90 (0.94)	1.10 (1.20)
Young-old			
SI	0.18 (0.39)	0.94 (0.90)	1.06 (1.03)
MCI	0.13 (0.34)	1.00 (0.89)	1.06 (0.93)
ECI	0.50 (0.97)	1.38 (1.54)	1.88 (1.63)
Total	0.27 (0.64)	1.10 (1.14)	1.33 (1.27)
Total			
SI	0.15 (0.36)	0.91 (0.91)	1.03 (1.02)
MCI	0.12 (0.33)	1.12 (0.89)	1.21 (0.93)
ECI	0.41 (0.99)	0.97 (1.29)	1.38 (1.63)
Incorrect			
Young			
SI	0.19 (0.75)	0.44 (0.51)	0.63 (0.81)
MCI	0.12 (0.33)	0.88 (0.78)	1.00 (0.87)
ECI	0.06 (0.24)	0.94 (0.94)	1.00 (1.03)
Total	0.12 (0.48)	0.76 (0.79)	0.88 (0.91)
Young-old			
SI	0.00 (0.00)	0.53 (0.62)	0.53 (0.62)
MCI	0.19 (0.54)	0.81 (1.33)	1.00 (1.41)
ECI	0.13 (0.34)	0.81 (1.28)	0.94 (1.29)
Total	0.10 (0.37)	0.71 (1.10)	0.82 (1.15)
Total			
SI	0.09 (0.52)	0.48 (0.57)	0.58 (0.71)
MCI	0.15 (0.44)	0.85 (1.06)	1.00 (1.15)
ECI	0.09 (0.29)	0.88 (1.09)	0.97 (1.14)
Confabulated			
Young			
SI	0.00 (0.00)	0.06 (0.25)	0.06 (0.25)
MCI	0.18 (0.53)	0.18 (0.39)	0.35 (0.61)
ECI	0.00 (0.00)	0.39 (0.85)	0.39 (0.85)
Total	0.06 (0.31)	0.22 (0.58)	0.27 (0.64)
Young-old			
SI	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
MCI	0.00 (0.00)	0.25 (0.58)	0.25 (0.58)
ECI	0.06 (0.25)	0.00 (0.00)	0.06 (0.25)
Total	0.02 (0.14)	0.08 (0.34)	0.10 (0.37)
Total			
SI	0.00 (0.00)	0.03 (0.17)	0.03 (0.17)
MCI	0.09 (0.38)	0.21 (0.49)	0.30 (0.59)
ECI	0.03 (0.17)	0.21 (0.64)	0.24 (0.65)

Table X.5

Mean accuracy of recall scores in the free recall phase, questioning phase and entire interview, as a function of age and interview type (showing standard deviations in brackets)

	Free Recall Phase	Questioning Phase	Entire Interview
Young			
SI	0.96 (0.04)	0.79 (0.06)	0.86 (0.04)
MCI	0.97 (0.02)	0.86 (0.06)	0.92 (0.03)
ECI	0.98 (0.02)	0.89 (0.05)	0.94 (0.03)
Total	0.97 (0.02)	0.85 (0.07)	0.91 (0.05)
Young-old			
SI	0.95 (0.04)	0.83 (0.06)	0.90 (0.04)
MCI	0.96 (0.03)	0.86 (0.06)	0.91 (0.03)
ECI	0.97 (0.02)	0.86 (0.05)	0.93 (0.02)
Total	0.96 (0.03)	0.85 (0.06)	0.91 (0.03)
Total			
SI	0.96 (0.04)	0.81 (0.06)	0.88 (0.04)
MCI	0.96 (0.02)	0.86 (0.06)	0.92 (0.03)
ECI	0.97 (0.02)	0.88 (0.05)	0.93 (0.02)

Table X.6

Mean completeness of recall scores in the free recall phase, questioning phase and entire interview, as a function of age and interview type

	Free Recall Phase	Questioning Phase	Entire Interview
Young			
SI	0.09 (0.02)	0.11 (0.03)	0.21 (0.05)
MCI	0.16 (0.03)	0.10 (0.03)	0.26 (0.04)
ECI	0.19 (0.06)	0.11 (0.03)	0.30 (0.06)
Total	0.15 (0.06)	0.11 (0.03)	0.26 (0.06)
Young-old			
SI	0.12 (0.03)	0.09 (0.02)	0.21 (0.04)
MCI	0.14 (0.04)	0.09 (0.02)	0.22 (0.05)
ECI	0.17 (0.03)	0.10 (0.02)	0.26 (0.05)
Total	0.14 (0.04)	0.09 (0.02)	0.23 (0.05)
Total			
SI	0.11 (0.03)	0.10 (0.03)	0.21 (0.05)
MCI	0.15 (0.04)	0.09 (0.03)	0.24 (0.05)
ECI	0.14 (0.05)	0.11 (0.03)	0.28 (0.06)

Appendix Y

Tables showing the unadjusted means and standard deviations from Study 4 (Chapter VI).

Table Y.1

Mean number of Action, Person, Object and Surrounding details recalled in the entire interview, as a function of age and interview type (Standard Deviations in brackets).

	Action	Person	Object	Surround	Total
Correct					
Low MMSE					
SI	12.92 (8.53)	24.25 (18.17)	10.42 (8.64)	7.67 (7.28)	55.25 (39.87)
MCI	23.77 (8.39)	43.08 (10.47)	15.15 (5.76)	12.00 (9.36)	94.00 (30.22)
ECI	19.27 (12.05)	34.45 (16.07)	13.27 (11.39)	7.82 (4.36)	74.91 (36.52)
Total	18.78 (10.47)	34.17 (16.68)	13.00 (8.72)	9.28 (7.51)	75.25 (38.23)
High MMSE					
SI	21.53 (8.59)	47.47 (19.82)	11.12 (4.81)	8.06 (5.57)	88.18 (31.05)
MCI	26.47 (9.86)	54.18 (17.99)	14.35 (4.91)	11.59 (6.59)	107.00 (30.29)
ECI	26.88 (10.33)	62.65 (26.00)	17.59 (8.12)	20.65 (13.25)	127.76 (52.11)
Total	24.96 (9.74)	54.76 (22.02)	14.35 (6.58)	13.43 (10.42)	107.65 (41.68)
Total					
SI	17.97 (9.46)	37.86 (22.13)	10.83 (6.53)	7.90 (6.21)	74.55 (38.05)
MCI	25.30 (9.19)	49.37 (15.98)	14.70 (5.21)	11.77 (7.76)	101.37 (30.45)
ECI	23.89 (11.46)	51.57 (26.32)	15.89 (9.58)	15.61 (12.32)	107.00 (52.85)
Incorrect					
Low MMSE					
SI	1.08 (1.31)	7.67 (6.05)	1.00 (0.85)	0.92 (1.17)	10.67 (7.20)
MCI	2.69 (2.69)	10.54 (6.16)	2.15 (2.99)	1.31 (1.44)	16.69 (9.36)
ECI	1.55 (1.70)	7.09 (4.06)	2.09 (1.70)	1.00 (0.78)	11.73 (5.99)
Total	1.81 (2.08)	8.53 (5.62)	1.75 (2.10)	1.08 (1.16)	13.17 (7.99)
High MMSE					
SI	0.82 (0.95)	11.41 (7.43)	2.12 (1.32)	1.24 (1.09)	15.59 (8.75)
MCI	1.06 (1.14)	9.76 (5.67)	1.53 (1.46)	1.35 (1.22)	13.76 (6.68)
ECI	0.76 (0.66)	8.94 (5.11)	1.71 (1.57)	1.88 (1.27)	13.29 (6.48)
Total	0.88 (0.93)	10.04 (6.11)	1.78 (1.45)	1.49 (1.21)	14.22 (7.29)
Total					
SI	0.93 (1.10)	9.86 (7.03)	1.66 (1.26)	1.10 (1.11)	13.55 (8.38)
MCI	1.77 (2.10)	10.10 (5.80)	1.80 (2.24)	1.33 (1.30)	15.03 (7.94)
ECI	1.07 (1.22)	8.21 (4.73)	1.86 (1.60)	1.54 (1.17)	12.68 (6.23)
Confabulated					
Low MMSE					
SI	1.00 (1.71)	1.58 (2.91)	0.75 (1.49)	0.17 (0.39)	3.50 (4.83)
MCI	0.38 (0.65)	2.00 (2.65)	0.00 (0.00)	0.08 (0.28)	2.46 (3.21)
ECI	0.18 (0.41)	1.27 (2.41)	0.36 (0.92)	0.18 (0.41)	2.00 (2.57)
Total	0.53 (1.11)	1.64 (2.61)	0.36 (1.02)	0.14 (0.35)	2.67 (3.63)
High MMSE					
SI	0.29 (0.77)	0.94 (1.20)	0.82 (1.88)	0.18 (0.53)	2.24 (3.44)
MCI	0.18 (0.53)	0.82 (1.29)	0.24 (0.44)	0.12 (0.33)	1.35 (1.90)
ECI	0.12 (0.33)	1.94 (3.31)	0.12 (0.33)	0.18 (0.39)	2.35 (3.66)
Total	0.20 (0.57)	1.24 (2.18)	0.39 (1.15)	0.16 (0.42)	2.21 (3.22)
Total					
SI	0.59 (1.27)	1.21 (2.06)	0.79 (1.70)	0.17 (0.47)	2.76 (4.04)
MCI	0.27 (0.58)	1.33 (2.04)	0.13 (0.35)	0.10 (0.31)	1.83 (2.56)
ECI	0.14 (0.36)	1.68 (2.69)	0.21 (0.63)	0.18 (0.39)	2.21 (3.22)

Table Y.2
Mean number of Action, Person, Object and Surrounding details recalled in the free recall phase, as a function of age and interview type (Standard Deviations in brackets)

	Action	Person	Object	Surround	TOTAL
Correct					
Low MMSE					
SI	7.58 (5.96)	7.67 (5.26)	4.25 (3.49)	1.75 (1.60)	21.25 (14.51)
MCI	15.69 (6.17)	19.08 (8.22)	7.92 (4.27)	5.08 (7.54)	47.77 (35.80)
ECI	14.36 (7.35)	14.27 (7.23)	7.36 (6.62)	2.82 (2.86)	38.82 (21.03)
Total	12.58 (7.27)	13.81 (8.37)	6.53 (5.03)	3.28 (4.97)	36.19 (22.70)
High MMSE					
SI	13.65 (5.78)	18.41 (9.72)	5.35 (2.47)	1.59 (2.32)	39.00 (16.63)
MCI	18.76 (5.71)	25.24 (10.43)	9.71 (3.98)	3.47 (2.92)	57.59 (16.40)
ECI	20.71 (7.36)	32.88 (15.33)	11.41 (5.82)	9.24 (9.14)	74.24 (33.42)
Total	17.71 (6.89)	25.51 (13.26)	8.82 (4.95)	4.76 (6.48)	56.94 (27.26)
Total					
SI	11.14 (6.50)	13.97 (9.69)	4.90 (2.93)	1.66 (2.02)	31.66 (17.88)
MCI	17.43 (6.01)	22.57 (9.88)	8.93 (4.14)	4.17 (5.38)	53.33 (20.18)
ECI	18.21 (7.88)	25.57 (15.63)	9.82 (6.35)	6.71 (7.92)	60.32 (33.70)
Incorrect					
Low MMSE					
SI	0.25 (0.62)	0.50 (0.67)	0.25 (0.45)	0.00 (0.00)	1.00 (1.21)
MCI	1.69 (1.93)	2.62 (1.94)	0.31 (0.63)	0.23 (0.44)	4.85 (3.16)
ECI	0.91 (1.14)	1.00 (1.00)	0.45 (0.69)	0.27 (0.47)	2.64 (2.16)
Total	0.97 (1.46)	1.42 (1.61)	0.33 (0.59)	0.17 (0.38)	2.89 (2.81)
High MMSE					
SI	0.29 (0.59)	1.47 (1163)	0.12 (0.33)	0.12 (0.33)	2.00 (2.15)
MCI	0.65 (0.79)	1.88 (2.03)	0.35 (0.49)	0.47 (0.87)	3.35 (2.52)
ECI	0.65 (0.70)	2.24 (1.72)	0.18 (0.53)	0.82 (0.95)	3.88 (3.29)
Total	0.53 (0.70)	1.86 (1.79)	0.22 (0.46)	0.47 (0.81)	3.08 (2.76)
Total					
SI	0.28 (0.59)	1.07 (1.39)	0.17 (0.38)	0.07 (0.26)	1.59 (1.86)
MCI	1.10 (1.47)	2.20 (1.99)	0.33 (0.55)	0.37 (0.72)	4.00 (2.87)
ECI	0.75 (0.89)	1.75 (1.58)	0.29 (0.60)	0.61 (0.83)	3.39 (2.92)
Confabulated					
Low MMSE					
SI	0.50 (1.00)	0.67 (1.37)	0.33 (0.65)	0.00 (0.00)	1.50 (2.84)
MCI	0.23 (0.60)	0.62 (0.96)	0.00 (0.00)	0.00 (0.00)	0.85 (1.52)
ECI	0.09 (0.30)	0.18 (0.41)	0.18 (0.41)	0.00 (0.00)	0.45 (0.69)
Total	0.28 (0.70)	0.50 (1.00)	0.17 (0.45)	0.00 (0.00)	0.94 (1.91)
High MMSE					
SI	0.24 (0.75)	0.29 (0.69)	0.18 (0.53)	0.00 (0.00)	0.71 (1.90)
MCI	0.18 (0.53)	0.47 (1.01)	0.18 (0.39)	0.06 (0.24)	0.88 (1.45)
ECI	0.06 (0.24)	0.65 (1.06)	0.06 (0.24)	0.18 (0.39)	0.94 (1.39)
Total	0.16 (0.54)	0.47 (0.92)	0.14 (0.40)	0.08 (0.27)	0.84 (1.57)
Total					
SI	0.34 (0.86)	0.45 (1.02)	0.24 (0.58)	0.00 (0.00)	1.03 (2.32)
MCI	0.20 (0.55)	0.53 (0.97)	0.10 (0.31)	0.03 (0.18)	0.87 (1.46)
ECI	0.07 (0.26)	0.46 (0.88)	0.11 (0.32)	0.11 (0.32)	0.75 (1.18)

Table Y.3
Mean number of Action, Person, Object and Surrounding details recalled in the questioning phase, as a function of age and interview type (Standard Deviations in brackets)

	Action	Person	Object	Surround	TOTAL
Correct					
Low MMSE					
SI	5.33 (3.70)	16.58 (13.22)	6.17 (5.94)	5.92 (6.11)	34.00 (26.57)
MCI	8.08 (3.84)	24.00 (6.39)	7.23 (3.19)	6.92 (3.38)	46.23 (13.29)
ECI	4.91 (5.65)	19.91 (12.81)	5.91 (5.94)	5.00 (2.24)	35.73 (21.67)
Total	6.19 (4.53)	20.28 (11.21)	6.47 (5.00)	6.00 (4.21)	38.94 (21.17)
High MMSE					
SI	7.88 (5.38)	29.06 (13.73)	5.76 (4.02)	6.47 (4.42)	49.18 (21.21)
MCI	7.71 (5.92)	28.94 (12.07)	4.65 (3.02)	8.12 (5.46)	49.41 (19.71)
ECI	6.18 (5.19)	29.82 (12.82)	6.18 (3.26)	11.47 (7.09)	53.65 (22.95)
Total	7.25 (5.45)	29.27 (12.64)	5.53 (3.46)	8.69 (6.03)	50.75 (21.00)
Total					
SI	6.83 (4.86)	23.90 (14.68)	5.93 (4.81)	6.24 (5.09)	42.90 (24.34)
MCI	7.87 (5.05)	26.80 (10.17)	5.77 (3.31)	7.60 (4.64)	48.03 (17.03)
ECI	5.68 (5.31)	25.93 (13.51)	6.07 (4.41)	8.93 (6.48)	46.61 (23.78)
Incorrect					
Low MMSE					
SI	0.83 (1.12)	7.17 (5.70)	0.75 (0.75)	0.92 (1.17)	9.76 (6.79)
MCI	0.92 (1.38)	7.92 (5.68)	1.85 (2.41)	1.08 (1.32)	11.77 (7.67)
ECI	0.64 (0.92)	6.09 (3.96)	1.64 (1.21)	0.73 (0.65)	9.09 (4.76)
Total	0.81 (1.14)	7.11 (5.13)	1.42 (1.68)	0.92 (1.08)	10.25 (6.52)
High MMSE					
SI	0.53 (0.72)	9.94 (7.05)	2.00 (1.32)	1.12 (1.05)	13.59 (7.88)
MCI	0.41 (0.62)	7.88 (5.37)	1.18 (1.24)	0.94 (1.14)	10.41 (6.68)
ECI	0.12 (0.33)	6.88 (4.27)	1.41 (1.18)	0.94 (0.90)	9.35 (4.64)
Total	0.35 (0.59)	8.24 (5.71)	1.53 (1.27)	1.00 (1.02)	11.12 (6.66)
Total					
SI	0.66 (0.90)	8.79 (6.57)	1.48 (1.27)	1.03 (1.09)	11.97 (7.58)
MCI	0.63 (1.03)	7.90 (5.41)	1.47 (1.83)	1.00 (1.20)	11.00 (7.03)
ECI	0.32 (0.67)	6.57 (4.10)	1.50 (1.17)	0.86 (0.80)	9.25 (4.60)
Confabulated					
Low MMSE					
SI	0.50 (1.17)	0.92 (1.73)	0.42 (1.44)	0.17 (0.39)	2.00 (2.95)
MCI	0.15 (0.38)	1.38 (2.14)	0.00 (0.00)	0.08 (0.28)	1.62 (2.47)
ECI	0.09 (0.30)	1.09 (2.39)	0.18 (0.60)	0.18 (0.41)	1.55 (2.42)
Total	0.25 (0.73)	1.14 (2.05)	0.19 (0.89)	0.14 (0.35)	1.72 (2.56)
High MMSE					
SI	0.06 (0.24)	0.65 (0.93)	0.65 (1.50)	0.18 (0.53)	1.53 (2.10)
MCI	0.00 (0.00)	0.35 (0.49)	0.06 (0.24)	0.06 (0.24)	0.47 (0.72)
ECI	0.06 (0.24)	1.29 (2.39)	0.06 (0.24)	0.00 (0.00)	1.41 (2.62)
Total	0.04 (0.20)	0.76 (1.53)	0.25 (0.91)	0.08 (0.34)	1.14 (2.00)
Total					
SI	0.24 (0.79)	0.76 (1.30)	0.55 (1.45)	0.17 (0.47)	1.72 (2.45)
MCI	0.07 (0.25)	0.80 (1.52)	0.03 (0.18)	0.07 (0.25)	0.97 (1.77)
ECI	0.07 (0.26)	1.21 (2.35)	0.11 (0.42)	0.07 (0.26)	1.46 (2.50)

Table Y.4

Mean number of correct, incorrect and confabulated Uncertain Response details recalled in the free recall (FR) phase, questioning (Q) phase and entire interview, as a function of age and interview type (Standard Deviations in brackets)

	FR Phase	Q Phase	Entire Interview
Correct			
Low MMSE			
SI	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
MCI	0.15 (0.56)	0.54 (0.78)	0.69 (1.03)
ECI	0.09 (0.30)	0.36 (0.67)	0.45 (0.69)
Total	0.08 (0.37)	0.31 (0.62)	0.39 (0.77)
High MMSE			
SI	0.06 (0.24)	0.59 (1.28)	0.65 (1.32)
MCI	0.00 (0.00)	0.35 (0.61)	0.35 (0.61)
ECI	0.24 (0.56)	0.82 (1.47)	1.06 (1.56)
Total	0.10 (0.36)	0.59 (1.17)	0.69 (1.24)
Total			
SI	0.03 (0.19)	0.34 (1.01)	0.38 (1.05)
MCI	0.07 (0.37)	0.43 (0.68)	0.50 (0.82)
ECI	0.18 (0.48)	0.64 (1.22)	0.82 (1.31)
Incorrect			
Low MMSE			
SI	0.00 (0.00)	0.08 (0.29)	0.00 (0.00)
MCI	0.15 (0.56)	0.54 (1.13)	0.69 (1.18)
ECI	0.00 (0.00)	0.27 (0.47)	0.27 (0.47)
Total	0.06 (0.33)	0.31 (0.75)	0.33 (0.79)
High MMSE			
SI	0.06 (0.24)	0.65 (1.06)	0.71 (1.05)
MCI	0.06 (0.24)	0.65 (1.27)	0.71 (1.36)
ECI	0.00 (0.00)	0.53 (1.07)	0.53 (1.07)
Total	0.04 (0.20)	0.61 (1.12)	0.65 (1.15)
Total			
SI	0.03 (0.20)	0.41 (0.87)	0.41 (0.87)
MCI	0.10 (0.40)	0.60 (1.19)	0.70 (1.26)
ECI	0.00 (0.00)	0.43 (0.88)	0.43 (0.88)
Confabulated			
Low MMSE			
SI	0.00 (0.00)	0.17 (0.39)	0.08 (0.29)
MCI	0.00 (0.00)	0.15 (0.38)	0.15 (0.38)
ECI	0.00 (0.00)	0.36 (0.92)	0.36 (0.92)
Total	0.00 (0.00)	0.22 (0.59)	0.19 (0.58)
High MMSE			
SI	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
MCI	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
ECI	0.00 (0.00)	0.12 (0.49)	0.12 (0.49)
Total	0.00 (0.00)	0.04 (0.28)	0.04 (0.28)
Total			
SI	0.00 (0.00)	0.07 (0.26)	0.03 (0.19)
MCI	0.00 (0.00)	0.07 (0.25)	0.07 (0.25)
ECI	0.00 (0.00)	0.21 (0.69)	0.21 (0.69)

Appendix Z

Tables showing the non-significant results for Study 4.

Table Z.1

Non-Significant results for participant performance across the entire interview.

	Detail Type	F	MSE	p
CORRECT				
Interaction	Action	$F\,(2, 81) = 0.78$	93.08	0.46
	Person	$F\,(2, 81) = 1.49$	368.01	0.23
	Object	$F\,(2, 81) = 0.90$	53.41	0.41
	Total	$F\,(2, 81) = 1.96$	1423.79	0.15
INCORRECT				
MMSE	Person	$F\,(1, 81) = 1.55$	35.02	0.22
	Object	$F\,(1, 81) = 0.01$	3.04	0.93
	Surrounding	$F\,(1, 81) = 2.57$	1.41	0.11
	Total	$F\,(1, 81) = 0.52$	56.65	0.47
Interview	Person	$F\,(1, 81) = 0.96$	35.02	0.39
	Object	$F\,(1, 81) = 0.30$	3.04	0.74
	Surrounding	$F\,(1, 81) = 0.69$	1.41	0.51
	Total	$F\,(1, 81) = 1.02$	56.65	0.37
Interaction	Action	$F\,(2, 81) = 1.59$	2.18	0.21
	Person	$F\,(2, 81) = 1.06$	35.02	0.35
	Object	$F\,(2, 81) = 2.08$	3.04	0.13
	Surrounding	$F\,(2, 81) = 0.90$	1.41	0.41
	Total	$F\,(2, 81) = 1.97$	56.65	0.15
CONFABULATED				
MMSE	Action	$F\,(1, 81) = 3.33$	0.67	0.07
	Person	$F\,(1, 81) = 0.55$	5.67	0.46
	Object	$F\,(1, 81) = 0.01$	1.16	0.93
	Surrounding	$F\,(1, 81) = 0.03$	0.16	0.86
	Total	$F\,(1, 81) = 0.85$	11.20	0.36
Interview	Action	$F\,(1, 81) = 2.74$	0.67	0.07
	Person	$F\,(1, 81) = 0.14$	5.67	0.87
	Surrounding	$F\,(1, 81) = 0.37$	0.16	0.69
	Total	$F\,(1, 81) = 0.63$	11.20	0.54
Interaction	Action	$F\,(2, 81) = 1.17$	0.67	0.32
	Person	$F\,(2, 81) = 1.10$	5.67	0.34
	Object	$F\,(2, 81) = 0.36$	1.16	0.70
	Surrounding	$F\,(2, 81) = 0.02$	0.16	0.98
	Total	$F\,(1, 81) = 0.49$	11.20	0.62

Table Z.2

Non-Significant results for participant performance in the free recall phase.

	Detail Type	F	MSE	p
CORRECT				
Interaction	Action	$F(2, 81) = 0.58$	40.85	0.56
	Person	$F(2, 81) = 2.58$	106.75	0.09
	Object	$F(2, 81) = 0.78$	20.81	0.46
	Total	$F(2, 81) = 2.40$	495.33	0.10
INCORRECT				
MMSE	Person	$F(1, 81) = 1.91$	2.66	0.17
	Object	$F(1, 81) = 1.16$	0.27	0.29
	Total	$F(1, 81) = 0.20$	6.57	0.65
Interaction	Action	$F(2, 81) = 2.17$	1.05	0.12
	Object	$F(2, 81) = 0.68$	0.27	0.51
	Surrounding	$F(2, 81) = 0.84$	0.41	0.44
	Total	$F(2, 81) = 2.51$	6.57	0.09
CONFABULATED				
MMSE	Action	$F(1, 81) = 0.76$	0.38	0.39
	Person	$F(1, 81) = 0.01$	0.93	0.93
	Object	$F(1, 81) = 0.14$	0.18	0.71
	Total	$F(1, 81) = 0.06$	3.01	0.81
Interview	Action	$F(1, 81) = 1.56$	0.38	0.22
	Person	$F(1, 81) = 0.13$	0.93	0.88
	Object	$F(1, 81) = 1.27$	0.18	0.29
	Surrounding	$F(1, 81) = 1.31$	0.04	0.28
	Total	$F(1, 81) = 0.38$	3.01	0.69
Interaction	Action	$F(2, 81) = 0.30$	0.38	0.74
	Person	$F(2, 81) = 1.38$	0.93	0.26
	Object	$F(2, 81) = 1.39$	0.18	0.26
	Surrounding	$F(2, 81) = 1.31$	0.04	0.28
	Total	$F(1, 81) = 0.97$	3.01	0.38

Table Z.3
Non-Significant results for participant performance in the questioning phase.

	Detail Type	F	MSE	p
CORRECT				
MMSE	Action	$F(1, 81) = 1.07$	25.95	0.30
	Object	$F(1, 81) = 0.97$	17.76	0.33
Interview	Action	$F(1, 81) = 1.50$	25.95	0.23
	Person	$F(1, 81) = 0.65$	148.52	0.53
	Object	$F(1, 81) = 0.01$	17.76	0.99
	Surrounding	$F(1, 81) = 1.10$	27.06	0.34
	Total	$F(1, 81) = 0.62$	449.64	0.54
Interaction	Action	$F(2, 81) = 0.60$	25.95	0.55
	Person	$F(2, 81) = 0.71$	148.52	0.49
	Object	$F(2, 81) = 0.89$	17.76	0.41
	Surrounding	$F(2, 81) = 2.66$	27.06	0.09
	Total	$F(2, 81) = 0.98$	449.64	0.38
INCORRECT				
MMSE	Person	$F(1, 81) = 0.96$	30.25	0.33
	Object	$F(1, 81) = 0.15$	2.04	0.70
	Surrounding	$F(1, 81) = 0.16$	1.13	0.69
	Total	$F(1, 81) = 0.43$	43.11	0.51
Interview	Action	$F(1, 81) = 1.07$	0.76	0.35
	Person	$F(1, 81) = 1.01$	30.25	0.37
	Object	$F(1, 81) = 0.09$	2.04	0.91
	Surrounding	$F(1, 81) = 0.26$	1.13	0.77
	Total	$F(1, 81) = 1.01$	43.11	0.37
Interaction	Action	$F(2, 81) = 0.14$	0.76	0.87
	Person	$F(2, 81) = 0.49$	30.25	0.61
	Surrounding	$F(2, 81) = 0.25$	1.13	0.78
	Total	$F(2, 81) = 1.21$	43.11	0.30
CONFABULATED				
MMSE	Person	$F(1, 81) = 0.90$	3.14	0.35
	Object	$F(1, 81) = 0.08$	0.79	0.78
	Total	$F(1, 81) = 1.39$	5.14	0.24
Interview	Action	$F(1, 81) = 1.61$	0.24	0.21
	Person	$F(1, 81) = 0.41$	3.14	0.68
	Object	$F(1, 81) = 2.56$	0.79	0.09
	Surrounding	$F(1, 81) = 0.71$	0.12	0.49
	Total	$F(1, 81) = 0.74$	5.14	0.48
Interaction	Action	$F(2, 81) = 1.27$	0.24	0.29
	Person	$F(2, 81) = 0.87$	3.14	0.42
	Object	$F(2, 81) = 0.27$	0.79	0.78
	Surrounding	$F(2, 81) = 0.62$	0.12	0.54
	Total	$F(1, 81) = 0.36$	5.14	0.70

Table Z.4

*Non-Significant results for participant performance on **uncertain responses** in the free recall phase, questioning phase and entire interview.*

	Phase	F	MSE	p
CORRECT				
MMSE	Free Recall	$F(1, 81) = 0.04$	0.13	0.84
	Questioning	$F(1, 81) = 1.80$	0.97	0.18
	Entire	$F(1, 81) = 1.75$	1.11	0.19
Interview	Free Recall	$F(1, 81) = 0.96$	0.13	0.39
	Questioning	$F(1, 81) = 0.64$	0.97	0.53
	Entire	$F(1, 81) = 1.16$	1.11	0.32
Interaction	Free Recall	$F(2, 81) = 1.28$	0.13	0.28
	Questioning	$F(2, 81) = 1.28$	0.97	0.28
	Entire	$F(2, 81) = 2.01$	1.11	0.14
INCORRECT				
MMSE	Free Recall	$F(1, 81) = 0.05$	0.07	0.83
	Questioning	$F(1, 81) = 2.04$	0.99	0.16
	Entire	$F(1, 81) = 2.14$	1.04	0.15
Interview	Free Recall	$F(1, 81) = 1.25$	0.07	0.29
	Questioning	$F(1, 81) = 0.44$	0.99	0.65
	Entire	$F(1, 81) = 0.98$	1.04	0.38
Interaction	Free Recall	$F(2, 81) = 0.63$	0.07	0.53
	Questioning	$F(2, 81) = 0.39$	0.99	0.68
	Entire	$F(2, 81) = 0.85$	1.04	0.43
CONFABULATED				
MMSE	Free Recall	$F(1, 81) =$ na	na	na
	Entire	$F(1, 81) = 2.96$	0.18	0.08
Interview	Free Recall	$F(1, 81) =$ na	na	na
	Questioning	$F(1, 81) = 1.22$	0.19	0.30
	Entire	$F(1, 81) = 1.67$	0.18	0.20
Interaction	Free Recall	$F(2, 81) =$ na	na	na
	Questioning	$F(2, 81) = 0.09$	0.19	0.92
	Entire	$F(2, 81) = 0.25$	0.18	0.78

Appendix Z_b

The Geriatric Depression Scale (Yesavage et al., 1983).

1) Are you basically satisfied with your life?
2) Have you dropped many of your activities and interests?
3) Do you feel that your life is empty?
4) Do you often get bored?
5) Are you hopeful about the future?
6) Are you bothered by thoughts you can't get out of your head?
7) Are you in good spirits most of the time?
8) Are you afraid that something bad is going to happen to you?
9) Do you feel happy most of the time?
10) Do you often feel helpless?
11) Do you often get restless and fidgety?
12) Do you prefer to stay at home, rather than going out and doing new things?
13) Do you frequently worry about the future?
14) Do you feel you have more problems with memory than most?
15) Do you think it is wonderful to be alive now?
16) Do you often feel downhearted and blue?
17) Do you feel pretty worthless the way you are now?
18) Do you worry a lot about the past?
19) Do you find life very exciting?
20) Is it hard for you to get started on new projects?
21) Do you feel full of energy?
22) Do you feel that your situation is hopeless?
23) Do you think that most people are better off than you are?
24) Do you frequently get upset over little things?
25) Do you frequently feel like crying?
26) Do you have trouble concentrating?
27) Do you enjoy getting up in the morning?
28) Do you prefer to avoid social gatherings?
29) Is it easy for you to make decisions?
30) Is your mind as clear as it used to be?

* all questions answered with a yes / no