Cross-Cultural Comparison of Implicit Beliefs and Self-Referent Beliefs about Aging and Memory Performance

by

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B.Com., University of British Columbia, 1989
B.A., University of British Columbia, 1994

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF ARTS

in the Department of Psychology

We accept this thesis as conforming
to the required standard

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ABSTRACT

This study investigated the relationship between beliefs about memory and memory performance within a cross-cultural context. Self-referent and implicit beliefs were measured with the Personal Beliefs about Memory Questionnaire (PBMI) and the General Beliefs about Memory Questionnaire (GBMI), respectively (Lineweaver & Hertzog, in press). Memory performance was measured with the Brief Visuospatial Memory Test – Revised (BVMT) (Benton, 1990). Participants were 60 South Indian males recruited from India (30 younger adults and 30 older adults) and 60 Canadian males (30 younger adults and 30 older adults). Results indicated that the Indian participants generally held more positive self-referent beliefs and they believed that memory for other adults is better further into later life than the Canadians participants. Intelligence, as measured by the Culture Fair Intelligence Test, (CFIT; Cattell & Cattell, 1960) was found to be significantly better for the Canadians, thus, it was used as a covariate measure in the memory performance analysis. The results from the memory performance analysis did not show any significant differences between the Indians and Canadians. Thus, even though beliefs were significantly more positive for the Indian participants, memory performance did not differ between these groups.

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Introduction

Although aging affords status to people in some countries, the elderly in North America and in many other industrialized nations often suffer a loss of power, control and self-esteem. In North America, old age has been depicted as a social problem and a period in which the gains made in youth are lost. Individuals in these societies frequently view aging with fear and distaste (Rodin, 1980). These implicit societal views have also had their impact on the field of psychology. For example, rather than examining gains and strengths unique to aging, much of the early research in psychology focused on the loss of youthful accomplishments (Labouvie-Vief, 1994). Thus, youth was typically described as a period of growth, gains and strengths, whereas aging was characterized as a time of decline, losses and weaknesses.

Given that research on aging has been influenced by the larger views held in society, it becomes difficult to objectively ascertain what actually takes place as one ages. In recent years, a few key researchers have begun to emphasize the importance of the context and its impact on aging research (e.g., Labouvie-Vief, 1994). These researchers have proposed that aging research be conducted with greater recognition given to the complex interrelationships among multiple factors that influence life course development. This contextual thinking has led to a re-examination of the effects of aging, and the results from these works have revealed a greater level of complexity and variation in many intellectual and social dimensions than previously thought. Hence, whereas earlier research proposed a decline in functioning, more intricate patterns of both losses and gains are now emerging.

One area of research that has received a great deal of attention has been age-related memory decline (e.g., Craik & Jennings, 1992; Hultsch & Dixon, 1990 & Light, 1991). Research in this field has shown that although memory functioning does decline with age, there is substantial variability across persons in the extent of this decline. In addition, not all types of memory systems decline systematically. Some aspects of memory were shown to be fairly stable and/or increase up to fairly late in life. Hence, the new picture that emerges of what happens to memory as one ages is much more rich and complex. In addition to describing what happens to memory as one ages, much effort has been put towards trying to identify an explanatory mechanism for age-related memory decline. The approaches taken range from relatively optimistic views that poorer memory in old age arises as a function of beliefs about memory, to relatively less optimistic views that declining memory ability is the consequence of irreversible age-related changes in basic mechanisms underlying cognition. The former perspectives are thought to be more optimistic because they allow more readily for intervention strategies and hence memory improvement.

The present study was designed to examine the potential impact of implicit and self-referent beliefs on memory performance. The general approach was to compare memory performance of individuals in North America with that of individuals in a culture in which the belief systems about memory and aging are thought to be more positive than in North America. A more optimistic belief view of memory aging would suggest that adults in the culture with more positive beliefs would show fewer or no age-related differences in performance than adults in North America where younger

adults would be expected to outperform older adults. In contrast, a less optimistic decline perspective would suggest that although cultures may vary in their beliefs about memory aging, performance differences in favor of the young should be expected regardless of beliefs. Thus, the first objective of this study was to assess beliefs about memory and aging within two distinct cultural groups: South Indian and Canadian. Second, tests of memory performance were conducted for these two groups to determine whether there were any differences in group performance. The following research questions were addressed in this study:

1. Are the implicit and self-referent beliefs of Indians significantly different than those of Canadians.
2. Will the performance on the memory tasks be significantly different as a function of age (young versus old) and/or culture (Indian versus Canadian).

If the more 'optimistic' theories of memory change hold, it is thought that the older participants from the culture with the more positive beliefs (in all probability the South Indians) will perform better when compared to the older North American participants on the memory performance measures. Presumably this is the case because the positive beliefs about memory and aging are thought to reduce memory decline as one ages. Conversely, if the 'pessimistic' biologically based explanations of memory decline hold, it is thought that even if there are differences in beliefs about memory between these two cultures, memory performance will not differ significantly as a function of culture as one ages.

Literature Review

Stereotypes about Older Adults

Negative beliefs about aging and the aged represent one of the most ubiquitous problems faced by older adults in our society today. Although most people in North America recognize that the elderly have many positive qualities, it is also commonly accepted that the elderly are viewed more negatively than young adults. Negative characteristics are attributed to old people because of their group identity despite their individual achievements and abilities. Butler (1969) argues that older adults are victims of pervasive forms of discrimination and disparagement which he referred to as ageism. The attitudinal basis of ageism appears to be systematic negative evaluations of older persons including generally inaccurate stereotypes of their character and capabilities (e.g. Arronson, 1966). According to Wetle (1989), common stereotypes applied to older persons imply that they are sick, sedentary, sexless, senile, and impoverished. Rubin and Brown (1975) state that as a group, old people have been perceived to be socially alienated, psychologically restricted and physically impaired. In addition, their capacity to determine and control important events in their own lives as well as in the lives of others has been judged by both younger and aged individuals to be severely diminished (Bengtson, Kasschau & Ragan, 1977).

Much of the work on stereotypes toward the elderly has focused on the basic question of whether older individuals are evaluated more negatively when compared to younger individuals. These types of studies suggest that when compared with younger individuals, general stereotypes towards the elderly are negative (Hummert, 1990). For

example, a comprehensive meta-analysis conducted by Kite and Johnson (1988) found more than a one-third standard deviation difference in the direction of more negative beliefs toward older people. They concluded that, on average, older adults were viewed as less competent than younger people. They also found that there were smaller differences between the evaluations of the elderly and younger targets when: (a) the studies used measures of personality traits as opposed to measures of competence, (b) specific information was provided about the target person compared with when general information was given, and (c) a between-subjects design was used. Thus, in addition to age being important in determining beliefs toward the elderly it appears that other types of information were also important.

The negative stereotypes held towards the elderly are not something that simply arise in adulthood. Research suggests that the common stereotypes and misconceptions about the aged that are prevalent among adults are also prevalent among adolescents. Lorge, Tuckman and Abrams (1963) found that junior and senior high school students saw people in their sixties and seventies as being inactive, lacking interests and losing significant adult roles. Kastenbaum and Durkee (1964) also found that adolescent and young adults had negative appraisals of old people. They perceived old age as being risky and generally unpleasant. Hickey and Kalish (1968) found that by eight years of age, children had developed negative views toward the aged. Jantz, Seefeldt, Glaper and Serock (1976) found that children also expressed negative beliefs about growing old themselves. They expressed sadness, regret, and a fear of growing old. Results from a study conducted by Issacs and Bearson (1986), suggested that by

the time children begin elementary school they have already begun to assimilate negative stereotypes about the aged. In addition, they reported that significant levels of ageist prejudice existed among children as young as six years of age. Thus, there is evidence that the formation of negative stereotypes takes place at a very young age.

Older adults have also been found to hold negative stereotypic views about their own age group. For example, Hummert (1993) found that the elderly tended to associate negative stereotypes with people in what she referred to as the middle-old (65-74 years) and the old-old (75 years and above) age ranges. Interestingly, this study also found that elderly respondents had significantly more stereotypes for elderly people than did the young adult respondents. This suggests that the older adults had more complex representations of the elderly than did the younger respondents. However, the older respondents were more likely than the young to apply stereotypes to the older age ranges (75 and above). The tendency for individuals to subscribe to beliefs that denigrate their social groups and potentially harm themselves exists not only among elderly people, but can also be found among African Americans, homosexuals, Jews, and most other stigmatized groups (Steele & Aronson, 1995).

Early research on perceptions of elderly individuals assumed the existence of a single pervasive negative stereotype of elderly people. Research examining general beliefs toward elderly individuals seemed to confirm this negative stereotype, with respondents consistently reporting more negative evaluations of elderly adults (Braithwaite 1986; Seefeldt, 1984). In contrast, research first conducted by Brewer, Dull and Lui (1981) suggested that people do not hold a single stereotype of elderly

individuals as a group, but rather have several stereotypes for different types of elderly individuals. In addition, they found that although the majority of stereotypes were negative, positive stereotypes were also associated with the aged. Schmidt and Boland (1986) also found similar results in their work on stereotypes of the elderly. In their study, they reported that of twelve stereotypes found to be associated with the elderly, eight of these stereotypes were negative and four were positive. Thus, it appears that stereotypes held of the elderly are more varied than was first presumed. This line of thinking also suggests that the elderly may not be evaluated more negatively than young people on all dimensions. It may be possible that people hold a wide variety of beliefs and expectations about the elderly that are sometimes inconsistent. For example, people may view the elderly as forgetful and yet at the same time value their knowledge and wisdom.

Beliefs about Memory

It appears that a number of broad negative stereotypes of the elderly exist in North America. Research has generally suggested adults hold negative views about the specific domain of memory and aging. Some of the main beliefs held by many people are that memory declines with age and that this decline is a serious concern. Also, the declines that occur as one ages have been thought to be more extreme than what actually occurs. In addition, memory declines are thought to be inevitable, irreversible and uncontrollable. In terms of explaining the declines, research has found that the failures of the elderly are more often attributed to internal and stable causes, such as age or inability, than are those of the young. Finally, research has found that although

the beliefs held about oneself (self-referent beliefs) and the beliefs held about other (general beliefs) are similar, there are some differences between these two views. Given that beliefs about memory are highly relevant for this study, these beliefs will be further investigated in this section.

There is a considerable amount of research that supports the view that most people believe that memory will decline with age. For example, Cutler and Grams (1988) found that the majority of North Americans believed that memory would inevitably decline in old age. Also, in Ryan's (1992) study, 142 adults between the ages of 18-74 reported significantly more positive expectations for memory in everyday life for persons aged 25 years than for those aged 70 years. Thus, both younger and older adults had lower expectations for the memory of older adults.

Instead of viewing declines in memory as an acceptable part of normative aging, older adults appear to be seriously concerned by these declines. Among the problems spontaneously reported by older persons, memory difficulties are frequently mentioned (Zarit, Gallagher & Kramer, 1981). In addition, many studies have found forgetfulness to be a common complaint among middle-aged and older adults (Lachman, Weaver, Bandura, Elliott, Lewkowicz, 1992). In a questionnaire survey concerning functional physical and mental difficulties, Gutmann (1987) reported memory failures to be the second most frequent complaint of elderly people. In this study, memory complaints were second only to complaints about arthritis and rheumatism and were higher than for any other physical disorder. In another study, 70 percent of a sample of community dwellers over the age of 75 said their memory was failing (Lowenthal, Berkman,

Buehler, Pierce, Robinson & Trier, 1967). Further, Zarit (1982) reported that memory complaints were made by approximately one-half of respondents over age 60 in a community survey and by two-thirds of persons 50 years of age and older in a psychiatric outpatient sample. These concerns about memory were commonly interpreted by the respondents as evidence of age-related and irreversible losses in cognitive abilities. Thus, not only is memory commonly viewed as declining, these declines appear to be of considerable concern.

Further, there is evidence to suggest that older adults hold exaggerated beliefs about the amount of decline in memory that accompanies aging. Thus, not only do many older adults complain about their memory, they appear to think that their memory is declining more than it actually is. This pessimism in the elderly is reflected by the fact that the majority of the elderly believe that senility is inevitable. This is an exaggeration since on an annual basis only about three percent of adults actually are assessed to have a dementia (American Psychiatric Association, 1994). It should be noted that the prevalence of dementia does increase with age with an approximate prevalence rate of 20% over the age of 85; however, that still means that approximately 80% of people over the age of 85 do not experience dementia (American Psychiatric Association, 1994). In addition, studies by Erber (1989) have demonstrated that the same memory failures are rated as more serious, more indicative of mental difficulty, and requiring more external intervention when attributed to an older adult than to a younger adult. Thus, although memory decline is commonly considered to take place

as one ages, it is also viewed as being more extreme and possibly related to mental difficulty and dementia as opposed to normative development.

Another belief held about memory decline is that the decline is inevitable and irreversible. In their analyses of beliefs over the life-span, Heckhausen, Dixon and Baltes (1991) found that forgetfulness and absent-mindedness were among the least desirable and least controllable changes anticipated in later life. Moreover, the majority of the elderly sample in Devolder and Pressley's (1989) study believed that biological factors were more important in determining memory performance than memory strategies. According to Devolder and Pressley, this common belief that memory is an innate ability can undermine motivation to acquire strategies since there is a presumption that biological determination is more important than personal effort or strategies that could be learned. Unfortunately elder adults seem to believe that innate ability is an important determinant of memory.

Given that many people believe that memory declines are inevitable and irreversible, it is not surprising that they also tend to believe that there is little that they can do to control (i.e. maintain or improve) their memory (Dixon & Hultsch, 1983; Lachman, 1991; Lachman et al., 1992). For example, evidence from a longitudinal study conducted by Lachman and Leff (1989) suggested that the elderly feel less in control of their intellectual functioning than do the young. Findings from this study, which consisted of following a sample of 63 elderly adults, revealed that there was no significant change in intellectual functioning over a five year period. There was, however, significant change in what Lachman and Leff termed intellectual control

beliefs. This aspect of external control can be defined as the belief that other people are better able to do things and that one becomes more dependent on others to solve cognitive problems in later life. This increase in beliefs about 'powerful others' control over intellectual functioning indicated that older persons see themselves as less competent than others and become more dependent on them to carry out cognitive tasks. It was unclear in this study as to why beliefs in intellectual control changed in later life when actual performance did not change. The researchers theorized that one possible explanation could be an acceptance on the part of the participants of stereotypes about cognitive decline in later life.

Related to the research on control over memory is research examining explanations given by older adults to account for their performance failures on various tasks. Attributional research has found that the failures of the elderly are more often attributed to internal and stable causes, such as age or inability, than are those of the young (Banziger & Drevenstedt, 1982, Blank, 1982, Lachman & McArthur, 1986, Rodin & Langer, 1980). For example, in a study conducted by Lachman and McArthur (1986), it was found that poor cognitive or physical performance by the elderly was attributed more to inability than was identical performance by the young, whereas good cognitive or physical performance by the elderly was attributed less to ability than it was for the young. Also the young discounted good performance in the elderly, whereas the elderly confirmed expectancies for poor performance in themselves and in other elderly. The authors suggested that one possible explanation for this negative view was that in most cases poor performance was expected for the elderly and that

expected outcomes tend to be attributed to internal causes whereas unexpected events are attributed to external causes. Thus, when performance was good it was unexpected for the elderly and therefore attributed to external causes. In contrast, when performance was poor it was expected for the elderly and hence attributed to internal causes. Although age differences are more consistently found for failures than for successes, there is some evidence that the successes of the young are more often attributed to internal and stable causes than are those of the elderly (Banziger & Drevenstedt, 1982; Gekoski & Knox, 1983). This unflattering attributional pattern is thought to reflect a stereotypic view of the elderly as being less competent than the young.

A question that has been raised is whether the beliefs about memory decline are the same for oneself (self-referent beliefs) as for others (general beliefs). It is typically assumed that age differences in beliefs about one's own memory are closely linked to beliefs about age changes that occur in the general population. Support for this assumption was found in a study conducted by Ryan (1993), who found that beliefs about memory change across adulthood were no weaker for the self than for typical others. From this study, Ryan argues that the group of adults in the study foresaw memory changes for themselves to the same degree as for typical older adults. Ryan postulates that beyond interpretations of the memory difficulties of others, these age-based beliefs may also underlie interpretations of peoples personal memory difficulties, "recall" of earlier memory capabilities, causal attributions for personal memory failures, sense of self-efficacy, and quality of memory performance. Camp and Pignatiello

(1988) uncovered results contrary to Ryan's study. In their study, they found that in the area of fact retrieval and inferential reasoning, there were negative general beliefs for others with positive personal beliefs for the self. Further, a recent study conducted by Lineweaver and Hertzog (in press) found that although self-referent and general beliefs were strongly related, personal beliefs were not merely an age-appropriate manifestation of general beliefs. In this study, Lineweaver and Hertzog found that personal beliefs were distinct from general beliefs. Thus, there is some compelling evidence that suggests that self-referent and general beliefs are not necessarily the same.

In summary, some of the main common beliefs held about memory is that memory declines with age and the decline is viewed as a concern. In addition, the declines in memory are believed to be more exaggerated than what actually occurs. Also, the beliefs about memory decline are considered to be irreversible, inevitable and uncontrollable. Attributional research has found that memory failures of the elderly are more often credited to internal and stable causes, such as age or inability, than are those of the young. Finally, research has found that although the beliefs held about oneself (self-referent beliefs) and the beliefs held about others (general beliefs) are similar, there are some differences between these two views.

Age-Related Changes in Memory

Are these generally held negative beliefs about memory and aging justified? Does memory inevitably decline with age? Are the declines irreversible and

uncontrollable? In this section, a brief review of the research literature detailing what happens to people's memory as they age will be presented.

Many theories characterizing memory systems have been proposed. Of the myriad of theories that exist, two perspectives have had a great impact in the field of memory and aging. One of these perspectives depicts memory as a set of discrete systems, each consisting of a neural substrate and associated cognitive and behavioral operating characteristics. The second perspective suggests that memory is determined by the processing operations carried out on the to-be-remembered information. Thus, from this latter perspective, memory can be characterized in terms of types of mental activities as opposed to postulating separate and identifiable memory systems (e.g. Craik & Lockhart, 1972, Roediger, Weldon, & Challis, 1989). A great deal of literature exists in support of both of these perspectives. However, for the purposes of this paper, a brief overview of age-related memory changes from the systems perspective will be presented.

The construct of memory has been conceptualized and broken down in a number of different ways. One of the dominant views depicts memory as made up of three discrete systems, namely, procedural, semantic and episodic memory (Tulving, 1983). Procedural memory is thought to be responsible for enabling organisms to retain learned connections between stimuli and responses. Semantic memory is characterized by the ability to represent information that is not perceptually present. Semantic memory involves information acquired about the world without reference to when or how this knowledge was acquired (Chiarello, 1994). Finally, episodic memory

can be described as memory for personally experienced events and their temporal location.

Recently, a fourth memory system has been proposed by Tulving and Schacter (1990) which they have called perceptual representational system (PRS). This fourth system is thought to be related to both procedural and semantic memory and it functions to improve the perceptual identification of objects. According to Tulving and Schacter, they believe that PRS is responsible for the phenomenon of priming in which prior exposure to a stimulus results in later facilitation of performance even in the absence of explicit or conscious recollection of the previous experience with the stimulus.

When examining the research pertaining to age-related changes in memory systems, it becomes readily apparent that memory performance is not uniform across systems. Research on age-related declines in three key memory systems, implicit, semantic and episodic, will be presented in the following section.

Implicit Memory. Research on implicit memory systems has uncovered relatively few age-related declines. A number of different strategies have been employed to assess implicit memory systems. In contrast to explicit memory tasks, which involve a direct request for and awareness of remembering, implicit memory tasks explore the influence of prior experience on performance in the absence of a specific request to remember. One way that implicit memory has been assessed is through priming tasks. One common task of this nature is the stem completion exercise which requires the participant to complete a word stem (e.g., app___) with the first

word that comes to mind. Prior presentation of a word increases the likelihood the stem will be completed with this word. This type of task relies more on perceptual or data driven processes that involve an exact match of stimuli. Other tasks appear to involve conceptual processing and are influenced by the semantic characteristics of the material. An example of such a task is the associative priming paradigm developed by Graf and Schacter (1985, 1987). In this task, participants are exposed to, or are asked to generate, new associations between unrelated pairs of words. In the test phase, the participants are again exposed to pairs of items consisting of a word and a stem or word fragment that is to be completed. Item pairs that were not seen previously act as a control set of stimuli. This task permits assessment of associative priming in which more same-pair items are completed with previously seen words than different-pair items.

Research has suggested that age differences in various priming tasks that rely solely on perceptual processes are minimal. In a recent meta-analysis Mitchell (1993) found that there were only small age-related differences favoring the young on such implicit memory measures. Furthermore, none of the age differences on these implicit measures reached statistical significance for any of the studies. Similarly, studies have revealed minimal age differences on the perceptually based verbal tasks compared to explicit measures of memory (Howard, 1991, Light & La Loie, 1993). Some studies using verbal implicit tasks, have found significant differences in favor of the young (e.g., Chiarello & Hoyer, 1988; Hultsch, Masson, & Small, 1991a,b). However, even in these cases, the magnitude of the age effects is much smaller than that observed with

direct memory tests. In another meta-analysis of 33 verbally based implicit memory tasks, Light and La Voie (1993) found small to moderate effect sizes indicating slightly better implicit memory performance in younger adults compared to older adults; however, the effect sizes were significantly smaller than the effect sizes on explicit recall or recognition tasks. Thus, there appears to be no evidence for age differences on implicit tasks that rely largely on data driven processes. Tasks that involve more conceptual information may show slight age differences in favor of the younger adults. However, these differences are minimal when compared with the effect sizes on direct memory tasks.

Semantic Memory. With regard to semantic systems, research has shown for the normal old, the semantic memory system does not decline significantly with age (see Light, 1991, for a review). Semantic knowledge has been explored through a variety of tasks. Three areas that have been examined in great detail are: (1) memory for the meaning of words, (2) memory for facts, and (3) memory for generic knowledge concerning specific domains or classes of events. With regards to word meaning, research has found that retaining word meaning in later life is fairly stable. Recognition vocabulary performance appears to remain stable until at least the seventh decade (Schaie, 1983). Picture vocabulary also show little decrement in the normal old (Albert, Heller, & Milbreg, 1988; Mitchell, 1989). It should be noted that although there is evidence to suggest that semantic information such as word meaning remains intact, it also appears that older adults may have increasing difficulty accessing

semantic information quickly or efficiently (Bowles, 1989; Maylor, 1990; Schaie & Willis, 1993).

A second domain of research has focused on age differences in factual knowledge about the world. Generally, the research examining age differences in retrieval of factual information has found either that there are no significant age differences or that middle-aged and older adults outperform younger adults (Lachman & Lachman, 1980; McIntyre & Craik, 1987).

A third domain of knowledge that has been explored has been the organized representation of generic knowledge concerning specific domains or classes of events such as the sequence of events involved in eating a meal at a restaurant or attending a sporting event. The organization of these common knowledge structures has been found to remain relatively stable across adulthood (Hess, 1985). Thus, semantic systems do not appear to show significant declines with age.

Episodic Memory. In contrast to the implicit and semantic memory systems, research evidence examining age-related change in the episodic memory has shown consistent and marked decline with increasing age. Much of this research has focused on tasks that require participants to recognize or recall verbal materials. Recall measures typically involve asking the participant to remember a number of items which are presented to them and then after a period of time recite all the items that they can recall. Recognition tasks, on the other hand, usually require that the participants be able to recognize the item to-be-remembered from a number of other distracter items. When episodic memory is assessed using recall tasks, significant age-related declines

are typically seen. When recognition tasks are used, age-related differences favoring the young are less apparent (Poon, 1985; Schonfield & Robertson, 1966), but are typically significant nonetheless.

Verhaeghen and his colleagues (1993), used meta-analysis to examine the age differences in three types of episodic tasks: word recall, paired associate recall and prose recall. They found that the performance of older adults was reliably poorer than that of younger adults on all three types of episodic tasks. The data from Verhaeghen et al. (1993) also suggest that the age differences in favor of the young observed on these tasks are general rather than specific. In other words, the majority of the moderator variables examined did not attenuate the overall age effects observed on the three tasks. The finding is interesting because some of these variables such as concreteness of items, cueing of recall, and learning instructions have been suggested as important variables that might influence the magnitude of age differences.

The results reported by Verhaeghen et al. (1993) address a limited set of laboratory verbal episodic tasks. It has been suggested that other sorts of episodic tasks may not show such pervasive age differences. However, research on episodic recall of nonverbal materials has found that that age differences favoring the young exist for these tasks as well. For example, large age differences have been found on tasks requiring free recall of pictures or drawings (e.g., Puglisi & Park, 1987; Park, Smith, Morrell, Puglisi, & Dudley, 1990). In addition, although studies have found that age differences on picture recognition tend to be small, the age differences become greater when the task is more difficult or when the time delays are longer (Park,

Puglisi, & Smith, 1986). Also, memory for the spatial location of objects shows significant differences in favor of the young (Light & Zelinski, 1983; Naveh-Behjamin, 1988).

In summary, there is some validity to the belief that memory declines with age. However, age-related decrements are not uniform across tasks. Generally the evidence suggests that the episodic memory system shows substantial age-related losses, whereas semantic memory and the PRS remain relatively stable well into late life.

Theories Proposed to Account for Age-Related Memory Declines

There is a great deal of evidence to support the idea that certain aspects of memory decline as a function of age. Many theories have been put forth to explain the mechanisms of this decline. Light (1991), has categorized a number of the main theories into four broad groupings: (1) failures of metamemory, (2) defective semantic encoding, (3) failures of deliberate recollection, and (4) diminished processing resources. These groupings vary considerably. On one end of this continuum are the views that poorer memory in old age is a function of negative beliefs held towards aging (e.g., Bandura, 1977, 1982; Langer & Levy, 1994; Levy, 1997). On the other end of the continuum are the views that declining memory ability is the consequence of irreversible age-related changes in the basic mechanisms underlying cognition (Cerella 1990). The former categories are more optimistic because they are amenable to the possibility of intervention strategies to improve memory ability, whereas the latter perspectives are more pessimistic in that they propose mechanisms that are more fixed and irreversible in nature.

In the next section, two of the more optimistic theoretical perspectives for age-related memory decline will be reviewed, namely, declines as a function of metamemory, and declines as a function of implicit social cognitions. Both of these theories are relevant to this study because they focus on how beliefs about memory may impact memory performance. These theories differ in that the mechanisms proposed for memory declines vary. In addition, the theories pertaining to deficits in metamemory are concerned with self-referent beliefs which consist of an individual's beliefs about efficacy, control and perceived changes related to their own cognitive functioning (Bandura, 1977, 1982; Berry & West, 1993). Theories of implicit social cognition, on the other hand reflect largely unconscious and untested beliefs about the nature of cognitive functioning, including central characteristics such as its development and course (Greenwald & Banaji, 1995).

Deficits in Metamemory. The term metamemory was originally used to refer to cognitions about memory (Hertzog & Dixon, 1994). These cognitions included knowledge of mnemonic strategies, the utility of strategies, the amount of effort required to execute particular strategies and memory capacity limitations (Flavell & Wellman, 1977). More recently, the domain of metamemory has been expanded to include three additional dimensions of metamemory: memory monitoring, memory related affect and memory self-efficacy (Hultsch, Hertzog, Dixon, & Davidson, 1988). These three dimensions represent perception or self-evaluations of memory rather than factual knowledge (Cavanaugh & Green, 1990). Memory related affect reflects the range of feelings and emotions related to, or generated by, memory situations.

Memory monitoring refers to self-knowledge about current memory use, contents, and states. Examples of memory monitoring includes, feeling of knowing judgments, on-line reports of strategy use, and evaluations of the accuracy of one's performance. The final dimension, memory self-efficacy refers to people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. The literature in this area has focused primarily on self-referent beliefs, or beliefs regarding one's own memory functioning. Examples of memory self-efficacy include beliefs about one's memory capacity, how much one's memory has changed, and the degree to which memory performance is under personal control. This last dimension, memory self-efficacy is relevant to this paper.

It has been suggested that older adults believe their memory abilities to be poor and this lack of self-efficacy with respect to memory has unfavorable consequences for performances. This perspective is derived from the self-efficacy theory of Albert Bandura (1986, 1989, 1992), who proposed that self-efficacy beliefs influence performance by way of the level of motivation an individual is willing to put forth in a task. In other words, self efficacy beliefs can enhance or impair performance through their effects on cognitive, affective, or motivational intervening processes. Applying this theory to memory beliefs and performance, it is believed that people who view memory as a cognitive skill that they can improve are likely to exert the effort needed to convert the experiences into recallable symbolic forms. Consistent with this expectation, the more strongly older adults believe in their memory capacities, the more time they devote to processing memory tasks cognitively. Higher processing effort, in

turn, produce better memory performance. Thus, according to Bandura (1986, 1989, 1992), perceived self-efficacy affects actual memory performance both directly and indirectly through level of cognitive effort. Bandura argues that those who regard memory as an inherent capacity that declines with biological aging have little reason to try to exercise control over their memory functioning. They are quick to read instances of normal forgetting as incidents of declining cognitive capacity. The more they disbelieve their memory capabilities, the poorer use they make of their cognitive capabilities. Thus, Bandura concluded that negative cultural stereotyping of the elderly can foster a sense of declining cognitive capability.

Supporting this theoretical perspective are studies which have found evidence that beliefs can influence behavior. For example, Schulster (1981) found that people's beliefs about their own ability to memorize material predicted not only their performance in a memory for trivia contest, but also the amount of money the participants were willing to wager on their performance. In another study, Broadbent, Cooper, Fitzgerald and Parkes (1982) found that beliefs about tendencies to make cognitive mistakes covaried with psychiatric symptoms under stress. In a third study, Rabbitt (1981) observed old adults talk to a single person in a group conversation and proposed that they did so because they are afraid of losing the thread of conversation if they try to follow more than one speaker. Thus, these studies suggest beliefs people have about their abilities are of interest because they provide information about actual abilities and their beliefs, regardless of their accuracy, affect behavior (Hermann, 1983).

Recent extensions of the social-cognitive framework into the area of memory functioning have also found some support for these formulations. For example, people who judge themselves inefficacious on memory tasks and who believe they lack control over their memory ability show poorer memory performance (Berry, West, & Dennehey, 1989; Hertzog, Dixon, & Hultsch, 1990; Lachman, Steinberg, & Trotter, 1987). Older adults exhibit more negative assessments of their memory capacity and blame forgetfulness on poor memory to a greater degree than do young adults (Blank, 1982; Hertzog et al., 1990; Weaver & Lachman, 1990). Further, self-efficacy appears to decline from young to late adulthood (Hultsch et al., 1988). In addition, there is evidence for a reduced sense of mastery on memory tasks in old age (Dixon, 1989). Collectively, these findings suggest that as people age, their beliefs about their memory ability may lead to increased dependency on others, avoidance of memory challenges, and a pattern of helplessness and demoralization in the face of memory difficulties (Elliot & Lachman, 1989).

Some studies have found that the magnitude of the relationship between beliefs and performance may be influenced by a number of factors such as the correspondence between the context in which self-efficacy is assessed and performance is measured and the familiarity of the memory task. For example, Berry and West (1989) found a stronger relationship between indicators of self-efficacy and performance for familiar everyday tasks (e.g. recalling phone numbers) than for more traditional laboratory tasks (e.g., recalling unrelated words). In addition, West, Dennehy-Basile and Norris (1996) found that congruence between predictions and actual performance was higher for

every day tasks when compared to laboratory tasks. Thus, experience with the tasks increased the congruence between predictions and performance.

Countering this perspective is the fact that there is no strong evidence that self-efficacy beliefs bear a causal relation to memory performance (Light, 1991). Indeed, there is some evidence that suggests that self-efficacy beliefs are influenced by performance (Hertzog et al 1990; Lachman & Leff 1989). Thus, although this is a promising area of exploration, the relationship between self-efficacy measures and memory performance does not mean that low self-efficacy causes poorer memory performance.

Memory Decline as a Function of Implicit Social Cognitions. Other relevant theories that have been proposed to explain declines in memory come from the social psychology literature under the heading of implicit social cognitions. The term implicit social cognition is a broad theoretical category that was offered to integrate and reinterpret established research findings, guide searches for new empirical phenomena, prompt attention to underdeveloped research methods and suggest applications in various practical settings (Greenwald & Banaji, 1995). Under the umbrella of implicit social cognition, a few researchers working in the area of implicit stereotyping (Banaji, Hardin, Rothman, 1993, Chanowitz & Langer 1981, Levy & Langer 1994, Levy, 1997) and implicit theories of cognition (Greenwald and Banaji, 1995) have presented theories of direct or indirect mechanisms with may contribute to age-related declines in memory. These theories are similar to the self-efficacy theories of memory decline in that they also propose that beliefs impact memory performance; however, the origins of

these beliefs and the proposed mechanisms are somewhat different. In addition, as noted earlier there is typically a distinction made between beliefs of others' versus self-referent beliefs. For the most part, the implicit social cognition perspective focuses mainly on beliefs about others or general beliefs, whereas, the self-efficacy theories focus on self-referent beliefs.

Implicit stereotyping has been defined as the activation of stereotypes without one's awareness (Banaji, Hardin, and Rothman, 1993). According to Banaji and Greenwald (1995), the use of the "implicit" label for stereotypes serves primarily to emphasize the connection of the existing body of social cognition research on stereotypes to recent cognitive psychological research on implicit memory (Smith & Branscombe, 1988). The term implicit cognition has, as its identifying characteristic, the idea that traces of past experience affect performance, even though the influential earlier experience is not remembered in the usual sense, that is, it is unavailable to self-report or introspection (Greenwald & Banaji, 1995). These two terms are related in that implicit theories of cognition are often widely shared within a culture or subculture, contributing to stereotypes about characteristic traits or behaviors of members of a certain group.

A key theoretical framework which has examined these constructs in the context of memory decline has been proposed by Levy and Langer (1994). These researchers postulated that negative stereotypes about aging may contribute directly to age-related declines in memory performance. They proposed that negative expectations about memory loss and aging in our culture may become a self-fulfilling

prophecy through a variety of indirect mechanisms which they referred to as premature cognitive commitments (Chanowitz & Langer, 1981). Premature cognitive commitments were defined as beliefs that one accepts unconditionally (i.e., implicit cognitions or implicit stereotypes), without considering or being aware of alternative forms that the information can take. Langer and Levy (1994) theorized that once the person processes information unconditionally, it arrests an individual's understanding of the accepted belief because it does not come up for reconsideration, even if such reconsideration would be advantageous. These researchers theorized that unconditional acceptance of information occurs frequently, and information that initially seems irrelevant such as information about old age that one encounters in childhood is often incorporated into beliefs. For example, a young child may be presented with negative stereotypic information about older adults as being mean and senile and the child may inadvertently allow this image to become the foundation or the schema for everything learned about old age (Langer, 1989).

In support of this view, research has been conducted which has demonstrated that much complex social interaction is accomplished mindlessly, that is, without an awareness of the relevant details that would seem necessary in order to accomplish that interaction successfully (Langer, 1978, 1989). There has also been some research to suggest that childhood exposure to the negative images of old age as seen in fairy tales, television, and everyday conversations in America can influence one's level of activity and alertness in old age (Rodin & Langer, 1980). Further, recent reviewers have

effectively documented the unconscious or automatic operation of stereotypes (Banaji & Greenwald, 1996; Bargh, 1994; Devine, 1989; Geis, 1993; Gilbert & Hixon, 1991).

Chanowitz and Langer (1981) have also found that conditions surrounding initial or first time exposure to information (i.e., information obtained "mindlessly" or implicitly versus "mindfully" of actively) impact its subsequent use. In a study conducted to examine this hypothesis, Chanowitz and Langer hypothesized that information initially perceived as irrelevant may be uncritically accepted. Further, if that information later became relevant, persons may become victims of their premature cognitive commitments. In this study one group of participants was exposed to "irrelevant" information about perceptual deficits whereas two other groups were provided information about perceptual deficits and were asked to process this information. All participants were then given a perceptual task and the group that was led to believe that the perceptual deficit information was irrelevant, displayed severe performance decrements relative to the other groups. Thus, there is some evidence to suggest that implicit stereotyping and implicit theories of cognition do exist as constructs. Furthermore, research studies have demonstrated that these constructs do impact behavior.

In the case of age-related declines in functioning, it is proposed that during the course of aging, individuals may become unnecessarily debilitated by their culture's premature cognitive commitment about memory loss when an alternate understanding of cognition of old age would be helpful (Levy & Langer, 1994). Chopra (1993) referred to a similar process as the "hypnosis of social conditioning" which is defined as

an induced fiction in which we have all collectively agreed to participate and accept unconditionally. He stated that negative outcomes of these self-fulfilling prophecies may occur from accepting these beliefs unconditionally. Ryan (1992), in her research about memory beliefs of Americans across the adult life-span, reported that old adults may find that their expectations about memory decline "lead to poorer memory performance through their indirect impact on decreased effort, less use of adaptive strategies, avoidance of challenging situations and failure to seek medical attention for disease-related symptoms of forgetfulness" (p. 41). Thus, when approaching a memory task, an older adult may not put forth his or her optimal performance because he or she may hold the belief that older adults do not have good memories and therefore should perform poorly. In this way the beliefs are thought to become self-fulfilling.

Two studies conducted by Perdue and Gurtman (1990) offer some support for the existence of implicit theories of cognition. In the first experiment, incidental learning of trait descriptions was found to be different depending upon whether they were encountered in questions concerning "old" persons or "young" persons. In an unannounced memory test, more negative traits were recalled when they had been encoded with reference to an "old" persons, and positive traits were retrieved more often when they had been encountered in a question about a "young" person. The second experiment showed that the labels "old" and "young" had the effect of increasing the accessibility of associated traits in semantic memory. These studies provided evidence that ageism, or the association of negative traits with the aged, has an "automatic" cognitive component. Automatic ageism was defined as heavily

routinized age-related biases in a person's perceptions which influence social judgments at a level below that at which one consciously ascribe traits to others. Thus, ageism might have an unintentional and perhaps unconscious component. Perdue and Gurtman believed that these automatic beliefs may be hard to eradicate if they have been incorporated into implicit personality theories or social schemata and are evoked without awareness on people's part.

Levy (1997) has also conducted some recent studies which offer support for this perspective. In one study, an intervention that activated positive stereotypes of aging without the participants' awareness was shown to improve memory performance, memory self-efficacy and views of aging in old individuals. Alternatively, an intervention that activated negative stereotypes of aging tended to worsen memory performance, memory self-efficacy and views of aging in the old participants. In addition, two explicit interventions, unlike the implicit interventions, did not influence the participants' memory performances. In another study, Levy (1997) demonstrated that for the strong effects to emerge from shifting stereotypes , the stereotypes must be important to one's self-image. Levy arrived at this conclusion by repeating her earlier study with young participants. She found that these young participants did not exhibit any of the significant interactions that emerged among the old participants. According to Levy these two studies highlight the potential for memory improvement in old individuals when the negative stereotypes of aging that dominate the American culture are shifted to more positive stereotypes.

A unique study conducted by Levy and Langer (1994), also explored whether negative views about aging contribute to memory decline in old age. Unlike the other studies, Levy and Langer approached this issue by employing a cross-cultural framework. Levy and Langer postulated that if negative views contribute to memory loss in old age then groups that hold positive views about old age should show less of a decline in memory. Tests of implicit beliefs about old age and memory tests were conducted for young and old mainland Chinese, American Deaf and American hearing groups. Members of the mainland Chinese and American Deaf cultures were recruited on the basis of the belief that they would be less likely than hearing Americans to be exposed to and accept negative stereotypes about aging. The results showed that the Chinese and American Deaf groups both had more positive implicit beliefs about aging than the American hearing group. In the memory performance tasks the two groups with positive beliefs performed significantly better than the American hearing group. In addition, the older Chinese group's performance was not significantly different than that of the young Chinese group. Thus, this study also offers strong support that implicit beliefs about memory effect memory.

There are, however, a number of potential criticisms of Langer and Levy's study. One of the concerns was whether the tests used to measure memory performance were equally valid for the three participant groups. One of the main memory tests that was used, the 7/24 instrument, (Lezak, 1983) required that patterns of seven dots on a grid be remembered and replicated. This task is similar to a common recreational pastime (the game Go) among the older Chinese people. Thus,

better performance on the memory tasks by the Chinese may not be a result of more positive implicit beliefs but rather, opportunities for prior practice in activities similar to the memory task.

Another instrumentation concern was that there was no direct measure of memory beliefs. Langer and Levy utilized the Palmore's (1988) Facts on Aging Quiz (FAQ) as a measure of perceptions of older adults capacity. In addition they used an open-ended question, "What are the first five words or descriptions that come to mind when thinking of somebody old?", in order to assess the dimensions of internality, positivity, and activity. They postulated that those participants who held more positive views about aging would describe more positive qualities in the open-ended questions and have more positive responses on the FAQ. None of these instruments directly assess what the participants believed about memory and aging. In addition, no distinction was made between self-referent beliefs and general beliefs.

Three other important issues about this study are that, the Deaf American Group may make greater efforts to maintain higher memory performance in order to compensate for not having hearing. Second, the sample size in this study was quite small. Finally, in this study, intelligence was not matched or controlled for across groups. Given that intelligence has been shown to be highly correlated with memory performance, (Lezak, 1983), there may have been pre-existing group differences that accounted for the differences seen in memory performance.

One way to differentiate whether the results from this study were due to implicit beliefs and not other outside factors was to conduct another cross-cultural study using

an alternate cultural group that also holds positive beliefs about aging. In this study, following Langer and Levy's lead, a cross-cultural study was conducted using South Indian participants from India and Canadian participants from Canada.

Attitudes Towards Older Adults in India

For this study, Indian participants from India were recruited. It was thought that Indians may hold more positive beliefs about aging than North Americans. This section reviews some of the literature about the role of older adults in Indian society. In addition, this section explores some of the beliefs held in Indian society about aging and older adults.

In order to understand the specific cultural meaning of the experiences of the elderly, a broader understanding of Indian culture is necessary. The treatment of contemporary India as a society of common and uniform cultural characteristics is ethnographically incorrect and potentially misleading. Culturally, three kinds of India exist today, namely: (1) continuation of traditional India, (2) transitional India, and (3) industrialized India (Pillai, 1985). Traditional India is described as a pre-industrial, agrarian culture. Transitional India can be defined as the India in transition from agrarian to industrial and from monarchical and colonialistic to democratic. Industrialized India, as the name reflects, is the metropolitan, industrialized, urban India.

Knowledge of pre-industrial agrarian, or traditional India is crucial to an understanding of elderly life experiences. In India, although there is move towards Westernization (Gupta, 1971), currently 70% of India is still rural and approximately

60% of Indians engage in farming as their primary source of livelihood (Encarta, 1994). Thus, for the majority of Indians the means of production are still linked to the land. Traditional India is depicted as subsistence based agrarian land economy supported by the land and handicrafts, with the means of production being human and animal energy. In societies such as India, where property is a key means of production, aged individuals are able to have some control over younger generations by having ownership of property. Furthermore, future occupations and chances for success of the younger generation are tied to seeking the favor of their elders who maintain control over the economic resources. Thus, the tradition of inheritance is a major economic and political factor that contributes to the loyalty and attachment of the children to the aged parents.

The elderly in traditional India also play a very active part in the socialization of children. In many ways, the care and honor given to the elderly in traditional India is structured through socialization. In societies such as India where extended family networks are dominant, older members exercise the greatest power and maintain the highest status (Cox, 1990). In India, the extended family of several generations living together is the basic family unit in agrarian communities (Kumar & Suryanarayana, 1990). Children are brought up to treat grandparents with reverence and respect. During auspicious occasions, and for the atonement of misdeeds, children are made to pray to the elderly for blessings and forgiveness. Furthermore, children are brought up with the conviction that not taking care of the needs of the elderly, showing disrespect to them, and doing or speaking anything that would emotionally hurt them, all

constitute sins (Pillai, 1985). The elderly in India play a very active part in the socialization of children. A good part of the socialization is done through story telling, of which their life stories and those of ancestors become dominant. As a result, the children are integrated into the family and society and they are brought to understand very early on that they are one part of a larger unit. This process can be contrasted with one that works towards creating individualistic and independent persons in industrial societies.

Religion also plays a role in how older adults are viewed and treated in various cultures. Religions in South East Asia have generally supported the extended family and higher status of elder members by the moral and ethical codes that they espouse (Cox, 1990). According to Eastern philosophy, aging is more of a cultural and spiritual process than it is biological. Old age is a time for personal growth and fulfillment for greater spirituality (Cohen, 1992).

Lastly, in traditional agricultural societies such as in India, the old are the repositories of knowledge. In societies such as India where illiteracy rates are still very high (in 1991 51% of population was illiterate - Encarta, 1994) and /or access to reading material is limited, this resource of knowledge provided by the elders in the community is invaluable. Furthermore, in the absence of public education, and private education being confined to the elite and privileged, much necessary knowledge is derived from ancestral sources and personal experiences. For this reason, one specific role of older people in India is to impart their learning to the young. They are viewed as experts of past problems/ solutions, of old customs and appropriate religious rituals.

The conventional belief is that the higher the person's age, the greater will be his or her knowledge or wisdom. Knowledge includes farming techniques, labour management skills, birthing information, child care, and the ability to maintain social dominance. Older persons being viewed as valuable knowledge bases is also reflected by the Indian term for old person, "siana", which means "wise one".

In terms of transitional India, and industrial India, vast and rapid social change has been occurring. This change has been attributed to the 'zations' - Westernization, modernization, industrialization, democratization and urbanization (Cohen, 1992). Colonialism introduced Western education, which fostered a democratic attitude in the family, as well as in the society. In addition, the experience of having an independent income motivated the individual toward entreprenurship and saving, as opposed to the collective family enterprises under the leadership of the oldest able patriarch. Under these circumstances, in contemporary transitional India and Industrial India, younger school educated members of joint families are more inclined to be discontent with the administration of the family seniors (Pillai, 1985). However, even given these changes, the elderly are still regarded with respect by the family and society in India. They are taken care of by at least one of the children and in most cases, they still enjoy favorable recognition, although not to the extent of traditional India.

There is a paucity of available literature concerning the nature of the Indian's beliefs about the memory of old persons. However, given that the Indian elderly play such an active and prominent role in later life as information givers and managers of

households, it is reasonable to suppose that Indians' views about memory and aging would probably convey a more positive outlook than the North American perspectives.

Thus, to compare, in the Western culture, aging is stereotypically depicted as a negative experience for the elderly involving issues such as social isolation, abuse, senility, and a host of other negative bi-products of industrial culture. Contrarily, for the most part, in India, old age is conceived as one of the stages of human development wherein a person attains maturity, wisdom, and economic and social stability, which social recognition and emotional fulfillment leading to the most final stage with is expected to be spiritual salvation (Prabhu, 1972).

Summary

In summary, the research on stereotypes of the elderly in North America suggest that although there are some positive stereotypes of the elderly, the negative stereotypes outweigh the positive ones. In addition, older adults themselves have been found to hold negative stereotypic views about their own age group. Furthermore, negative stereotypes about older adults do not simply emerge in early adulthood. Research has uncovered ageist prejudices in children as young as six years of age (Issacs and Bearson, 1986). Thus, there is evidence that the formation of negative stereotypes takes place at a very young age.

Similarly, there is a great deal of evidence that points to increasingly negative views about memory and aging in North American populations. As was the case for broader negative stereotypes, it appears that not only young adults hold negative views about memory and aging, but older adults also hold these views. In addition, the

declines in memory are thought to be more extreme than what actually occurs. Some of the main negative beliefs held about age-related memory changes is that memory declines occur and these declines are irreversible, uncontrollable and inevitable. Attributional research has found that memory failures of the elderly are more often credited to internal stable causes, such as age or inability, than are those of the young. Finally, research has found that although the beliefs about oneself (self-referent beliefs) and the beliefs held about others (general beliefs) are similar, there are some differences between these two views.

Research examining what actually happens to memory as one ages has found that some types of memory systems do decline with age, however, other types of memory systems increase or maintain stability well into late life. Research evidence suggests that episodic memory systems show substantial age-related losses, whereas semantic memory and implicit memory systems remain relatively stable well into late life. Hence, there is some support for the beliefs that memory declines with age, however, the declines have not been found to occur in all memory systems. In addition, there is a substantial variability across persons in memory decline.

Given that certain aspects of memory do decline with age, a number of theories have been proposed to explain the mechanisms for this age-related decline. Two theoretical perspectives for age-related memory decline, namely, declines as a function of metamemory, and declines as a function of implicit social cognitions have been presented. Both of these theories are similar in that they relate how beliefs about

memory affect memory performance. In addition, both perspectives propose that negative beliefs result in poorer memory performance.

A cross-cultural study conducted by Langer and Levy (1994) offered support for the latter theoretical perspective. This study was unique in that the researchers compared the beliefs about memory and aging in different cultural groups. The premise was that groups that hold more positive beliefs about memory and aging will perform better on memory tasks. The results from Langer and Levy's study supported this premise.

Hypotheses

The goal of this study was to assess the potential impact of implicit and self-referent beliefs on memory performance. A comparison of memory beliefs and memory performance between young and old participants from North America and India was conducted. Participants from India were recruited because research suggests that old age is viewed far more positively in India than in North America. Thus, the first objective of this study was to compare the self-referent and implicit beliefs about memory and aging between South Indian participants and Canadian participants. The hypothesis that was tested for this part of the study is as follows:

1. Implicit and self referent beliefs for the Indian groups (as measured by the Personal Beliefs about Memory Instrument and the General Beliefs about Memory Instrument) will be more positive than those of the Canadian groups.

The second part of this study involved testing intelligence and memory performance to ascertain whether there were any differences in group performance. If intelligence was found to be significantly different between groups, it would have been controlled for in the memory performance analysis. Thus, additional hypotheses that were tested are as follows.

2. The performance on the intelligence test (as measured by the Culture Fair Intelligence Test) will not be significantly different as a function of age and/or cultural group. If intelligence is found to be different

between groups then, intelligence will be used as a covariate for the memory performance analyses.

3. The performance of the young groups (Indian and Canadian) on the memory tasks (as measured by the Brief Visuospatial Memory Task) will not be significantly different.

The final hypothesis relates to whether memory beliefs impact memory performance. Support for a more optimistic view of memory and aging would be provided if memory performance is found to be significantly better for the old Indian participants than the old Canadian participants. In other words, if the older Indians hold more positive beliefs and they perform significantly better on the memory performance measures than the older Canadians, then beliefs cannot be ruled out as having a positive effect on memory performance. Alternatively, a less optimistic decline perspective would be supported if memory performance does not differ significantly between the older groups. Thus, in the case where beliefs held by Indian participants are significantly more positive and there is no significant difference in performance, then support for the idea that positive beliefs effect memory performance is not found. For this study, coming from the perspective of the more positive beliefs view, the last hypothesis was as follows:

4. The older Indian group will perform better on the memory tasks (as measured by the Brief Visuospatial Memory Task) than the older Canadian group.

Method

Research Participants

The participants consisted of members of two cultural/ national groups: Canadians residing in Victoria, British Columbia, Canada (population, approximately 325,000) and South Indians residing in Lucknow, Uttar Pradesh, India (population, approximately 1,000,000). In both cases the participants consisted of younger and older men residing independently in the community. Only men were recruited to participate in this study because in the course of obtaining volunteers, it was very difficult to recruit older Indian women in India who could speak some English and/or who were literate. It was expected that this may be the case, because historically, the opportunities for education for Indian women were much lower than for Indian men. Thus, there are fewer Indian women who are literate when compared to Indian men.

All participants were recruited through either formal means, such as placing advertisements in community centers and with specific community groups, or informal means such as relying on word of mouth and asking participants whether they knew others who may be interested in participating. All potential participants were told that the requirements for participating in the study included being in relatively good health. In addition, participants were required to be able to read either English and/or Hindi. Participants did not undergo a physical examination, but individuals who indicated they had experienced serious acute and or chronic illnesses such as stroke or heart attack within the past year were not accepted into the sample. When older Indian participants were being recruited and tested, it was discovered that three participants who initially

reported that they were in good health had actually experienced serious chronic illnesses. These participants were replaced with three participants who met the health requirements for this study.

Young Canadian Group. The young Canadian sample consisted of 30 men between the ages of 19 and 25 years (M = 22.80; SD = 1.95). The majority of these participants were full-time students (93.3%), with the remaining few being either part-time students (3.3%) or full-time workers (3.3%). The average number of years of education for this group was approximately 16 years (M = 16.03; SD = 1.81). In terms of level of education, 13.3% reported that they had obtained their high school diploma, 10% reported that they had completed or were in presently a technical, trade, nursing or business school , 63% reported that they had completed or were currently completing an undergraduate degree and 13.3% stated that they had completed or were in the process of completing a graduate degree.

Because North America is a mosaic of diverse cultures and ethnic groups, an attempt was made to restrict sample membership to those who would be considered to be 'representative' of the dominant cultural group in North America. Characteristics of the dominant North American cultural group were identified as being Caucasian and of Northern European descent. In this sample, all participants reported that their ethnic background was European, Canadian or American. Furthermore, all participants in this group reported that their native language was English and that they were born in Canada. Thus, this participant group was Canadian born and Caucasian with family lineage from either Northern Europe or the U.S..

With regards to religious affiliation, 30% of the sample reported that they were Protestants, 23.3% of the sample reported that they were Catholic or came from Catholic families, 43.3% stated that they were agnostic and 3.3% reported that they were 'other'. In terms of marital status, all the participants in this group reported that they were single.

When compared to a perfect state of health, 53.3% of participants reported that they were in very good health, 36.7% reported that they were in good health and 10% reported that they were in fair health. When asked to compare their health with others their age, 30% reported that they were in very good health, 60% reported that they were in good health and 10% reported that they were in fair health. When asked about the effects of any sickness, injury or health problems in the four weeks prior to testing, 76.6% reported that they had not been sick, 6.7% reported that they has visited a doctor in the past four weeks due to health problems, 16.7% reported that they did get out but were bothered by their health. In the year prior to testing, 30% of this sample had not made a visit to the physician, 20% had visited the physician once, 33.3% had visited the physician between 2 to 4 times and 16.7% had visited between 5-12 times.

Some participants reported certain chronic health related conditions, however all reports of these conditions were identified as being not too serious. The chronic health related conditions reported were: difficulty seeing even with glasses (3.3%), arthritis (3.3%), asthma (3.3%), low blood pressure (6.7%), stomach ulcers (3.3%) and spinal condition or back trouble (6.7%). Thus, based on self-reported health, this group is fairly healthy and reports no serious health problems.

Young Indian Group. The 30 young Indian men recruited also ranged in age from 19 and 25 years (M = 22.90, SD = 1.95). As in the case of the young Canadian group, the majority of the Indian participants were full-time students. In this sample, 80% reported that they were full-time students, 10% reported that they were employed full-time and 10% reported that they were currently looking for work. The number of years of education ranged between 12 years and 20 years (M = 14.93; SD = 1). Of the young Indian participants, 26.7% reported that they had completed high school, 3.3% stated that they had either completed or are currently in a technical, trade, nursing or business school program, 50.7% reported that they had completed or are currently in an undergraduate program in a university and 16.7% reported that they had either completed or are currently in a graduate program.

Because India is also a culturally and ethnically diverse nation, an attempt was made to select participants who were of Indian origin. Further, given that 80% of Indians in India are Hindu and Hindi is India's national language, an attempt was made to recruit participants who were Hindu and viewed Hindi as their native tongue. Most of these participants reported that their native language was Hindi (96.7%) with only 3.3% identifying their native language as being Punjabi. All the participants of the young Indian sample described their ethnic background as being Indian. Although the testing instruments had been translated into Hindi and there was a Hindi speaking interpreter during the testing sessions, an attempt was made to select participants who could speak English. All participants stated that they could understand spoken English and all participants could speak English to some degree. Most were quite proficient in

English; however, some were a little poorer. In the cases where the participants felt more comfortable in Hindi, the tests were administered in Hindi.

Of the sample, 76.7% reported that their religious persuasion was Hindu, 10% stated that they were Muslim, 10% described themselves as Sikh and 3.3% stated that they were Jains. With regards to marital status, 86.7% reported that they were single and 13.3% reported that they were married.

When compared to a perfect state of health, 33.3% of participants reported that they were in very good health and 66.7% reported that they were in good health. Identical results were obtained when the participants were asked to compare their health with others their age. When asked about the effects of any sickness, injury or health problems in the four weeks prior to testing, 63.3% reported that they had not been sick, 16.7% reported that they had visited a doctor in the past four weeks due to health problems, 13.3% reported that they did get out but were bothered by their health, 3.3% stated that they were in bed most of the time for a day or more and 3.3% reported that they were required to go to the hospital. In the year prior to testing, 26.7% of this sample had not made a visit to the physician, 30% had visited the physician once, 26.7% had visited the physician between 2 to 4 times, 13.3% had visited between 5-12 times and 3.3% had visited the physician over 12 times.

Although no one in this group reported any serious health problems, some participants did report certain chronic health related conditions, namely: difficulty seeing even with glasses (13.3%), arthritis (3.3%), emphysema (3.3%), high blood pressure(3.3%), gall bladder or liver trouble (6.7%), spinal condition or back trouble

(6.7%). Thus, as with the young Canadian group, the young Indian participants appear to be fairly healthy.

Old Canadian Group. The men from the old Canadian group ranged in age from 65 to 87 years (N = 30, M = 75.17, SD = 6.13). All the participants in this sample stated that they were retired at the time of testing. The average number of years that this group had been retired was 12 years, 6 months (SD = 6.63). When asked to describe the majority of life-time employment, 43.3% stated that their type of employment was of a professional nature, 20% stated that they occupations were mainly technical or trade specific, 26.7% reported that their occupations were mainly semi-skilled and 3.3% described their employment as being other.

The average number of years of education for this group was 14.7 (range = 7 to 20 years; SD = 3.60). Half of the sample reported that they had completed high school and 3.3% stated that they completed technical, trade, nursing or business school. Approximately one-quarter of this sample (23.3%) reported that they had completed some amount of under graduate work and the same number (23.3%) stated that they had completed some amount of graduate work.

The native language of all of these participants was English and all identified their ethnic background as being Northern European, Canadian or American. Unlike the young Canadian sample, not all participants in this group were born in Canada or the US. However, all the participants reported that they had spent the majority of their lives in North America.

In terms of religious persuasion, most the participants in this sample described themselves as being Protestant (80%). The remaining participants in this sample reported that they were either Catholic (3.3%) or Agnostic (16.7%). The majority of this sample,(86.7%) reported that they were married, 3.3% reported that they were single and 10% reported that they were widowed.

When asked to compare their overall health to a perfect state of health, 40% stated that they were in very good health, 50% reported that they were in good health, 6.7% described themselves as being in fair health and 3.3% reported that they were in very poor health. When asked to compare their health with others their age, 36.7% reported that they were in very good health, 60% described themselves as being in good health and 3.3% described themselves as being in poor health. When asked about the effects of any sickness, injury or health problems in the four weeks prior to testing, 60% reported that they had not been sick, 33.3% reported that they had visited a doctor in the past four weeks due to health problems, 3.3% reported that they did get out but were bothered by their health and 3.3% stated that they were kept home but were still able to get around. In the year prior to testing, 3.3% of this sample had not made a visit to the physician, 16.7% had visited the physician once, 53.3% had visited the physician between 2 to 4 times, 23.3% had visited between 5-12 times and 3.3% had visited the physician over 12 times. A number of specific health concerns were identified by the old Canadian group. The percentage of participants reporting various health concern are detailed in Table 1.

Old Indian Group. The average age for the older Indian participants was 72 years, 11 months (range = 65 to 84 years; SD = 3.20). Most participants, (96.7%) stated that they were retired at the time of testing and only 3.3% reported that they were employed. The average number of years this group had been retired was 13 years, 11 months with the years of retirement ranging between 0 and 37 years. When describing the majority of life-time employment, 66.7% stated they had been employed in a professional capacity, 16.7% stated that they occupations were mainly technical or trade specific and 16.7% reported that their occupations were mainly semi-skilled.

The average number of years of education for this group was 15.2 years. The number of years of education ranged between 10 years and 22 years. Approximately a third of this sample (30%) reported that they had completed high school and 13.3% reported that they had completed technical, trade, nursing or business school. Further, 23.3% reported that they had completed some amount of under graduate schooling and 33.3% reported that they had completed some degree of graduate work.

All the participants in this sample described themselves as being Indian. As was the case of the young Indian group, an attempt was made to locate English speaking participants. All the participants of this group were able to communicate in English to some degree. In terms of native language, 70% of the participants stated that Hindi was their native language, 16.7% reported that their native tongue was Punjabi and 3.3% reported that that they spoke Tamil.

With regards to religion, most the participants in this sample described themselves as being Hindu (76.7%). Of the sample, 16.7% reported that they were

Sikh, 3.3% stated that they were Jains and 3.3% identified their religious persuasion as Christian. In terms of marital status, 83.3% reported that they were married, 6.7% reported that they were single and 10% reported that they were widowed.

When asked to compare their overall health to a perfect state of health, 16.7% of the participants stated that they were in very good health, 63.3% reported that they were in good health, 16.7% described themselves as being in fair health and 3.3% reported that they were in poor health. When comparing themselves with others their age, 40% reported that they were in very good health, 43.3% described themselves as being in good health,13.3% described themselves as being in fair health and 3.3% stated that they were in poor health. When asked about the effects of any sickness, injury or health problems in the four weeks prior to testing, 53.3% reported that they had not been sick, 3.3% reported that their health problems had required them to go to the hospital, 30% reported that they has visited a doctor in the past four weeks due to health problems, 3.3% reported that they were active but were bothered by their health and 10% stated that they were kept home but were still able to get around. In the year prior to testing, 46.7% of this sample had not made a visit to the physician, 6.7% had visited the physician once, 36.7% had visited the physician between 2 to 4 times, 6.7% had visited between 5-12 times and 3.3% had visited the physician over 12 times. As with the older Canadian group, some of the older Indian participants identified a number of specific health concerns. These concerns along with the percentage of older Indian participants reporting these concerns are detailed in Table 1.

Table 1

Percentage of Older Participants with Self-reported Health Problems

	Older North American Group (n = 30)		Older Indian Group (n = 30)	
Health Concern	Not too serious	Fairly serious	Not too serious	Fairly serious
Trouble hearing (even with hearing aid)	23.3%	3.3%	6.7%	
Trouble seeing (even with glasses)	20%	6.7%	20%	3.3%
Arthritis, Rheumatism	33.3%	13.3%	26.7%	13.3%
Asthma			6.7%%	3.3%
Bronchitis	6.7%	3.3%	6.7%	3.3%
Emphysema	3.3%	3.3%		
Tuberculosis			3.3%	
Hardening of arteries	3.3%		3.3%	
High blood pressure	26.7%	3.3%	20%	
Low blood pressure			3.3%	
Heart trouble	10%		3.3%	10%
Stroke	3.3%			
Gall bladder or liver trouble	3.3%	3.3%	3.3%	
Stomach ulcer	3.3%			
Kidney or bladder trouble	10%	3.3%	3.3%	
Spinal condition or back Trouble	20%	3.3%	13.3%	
Diabetes			6.7%	
Thyroid or goiter	3.3%		3.3%	
Prostate problems	6.7%	16.7%	10%	3.3%
Anemia	3.3%			
Cancer	10%			

Measures

Four domains were assessed using self-report questionnaires and performance measures: (1) demographic and health characteristics, (2) personal and general beliefs about memory, (3) visuospatial memory performance, and (4) intelligence. Because this study was cross-cultural, an effort was made to select instruments that would minimize bias across culturals. All questionnaires were translated into Hindi for those participants who stated that they were more proficient in Hindi rather than English.

Demographic data sheet. The 25 item demographic data sheet was adapted from the measures used in the Victoria Longitudinal Study (Hultsch, Dixon & Hertzog, 1990). It included items such as age, education, marital status, employment status, native language, religion and self-reported health variables (see Appendix B).

Beliefs about Memory Instrument. The Personal Beliefs about Memory Instrument (PBMI) which measured beliefs about one's own memory and the General Belief about Memory Instrument (GBMI), which measured beliefs about the memory functioning of the general population (Lineweaver & Hertzog, in press) were employed to obtain scores for memory beliefs. The PBMI and the GBMI were selected because, unlike questionnaires used in many previous studies, a clear distinction is made between personal and general beliefs. Further, the GBMI component of the instrument allows participants to express their general beliefs about aging across the entire adult life span, rather than being limited to one or two specific ages.

The PBMI instrument asked questions about three broad memory domains: memory efficacy, change and control. Memory efficacy refers the beliefs one holds

about the effectiveness of one's own memory. Memory self-efficacy includes motivation, cognitive knowledge and resources and behaviors and skills to meet task demands. Memory efficacy was further dimensionalized into two constructs: (1) Global Memory Efficacy (beliefs about memory or remembering in general), and (2) Specific Memory Efficacy (beliefs about any particular class of things that could be remembered, such as names or where an everyday object has been placed). Change beliefs are defined as beliefs about intraindividual change in memory functioning over time. Change was dimensionalized into: (1) Retrospective Change (perceived as already having occurred), and (2) Prospective Change (expected in the future). Finally, control beliefs refer to beliefs about whether what one does can affect one's memory functioning. Control was examined within three temporal perspectives: (1) Present Control Over Present Functioning (control over present performance), (2) Present Control Over Future Functioning (control over change), and (3) Future Control Over Future Functioning (control over future performance).

The GBMI instrument was made up of questions pertaining to two broad memory domains: (1) memory efficacy and (2) memory control. As was the case with PBMI, the memory efficacy was dimensionalized into Global Memory Efficacy and Specific Memory Efficacy. In addition, the memory control domain was examined within two temporal perspectives in the GMBI, namely: (1) Present Control Over Present Functioning and (2) Present Control Over Future Functioning.

Both PBMI and GBMI utilize a graphic rating response format for assessing memory beliefs memory (see Appendix B). Items on these instruments required

judgments on highly similar dimensions but they were presented in different formats to minimize carry-over effects. The instruments were designed so that participants were able to demonstrate both positive and negative beliefs. For example the PBMI asked participants to complete the statement "Between now and ten years from now, my memory will" with the available responses being a range from "greatly decline" and "greatly improve". On both questionnaires, the distances between the lower end point of the scale and the response of participants are measured with a ruler and the distance represented the score for the participant on that item. Ratings (in cm) range from 0 to 10 on the PBMI and from 0 to 8.4 on the GBMI.

The PBMI as a whole, and when broken down into scales and subscales demonstrated high internal consistency. The internal consistency for the PBMI as a whole is very high (Cronbach's alpha = 0.96). Furthermore, the alpha estimates for the instrument scales ranged from 0.93 (control) to 0.95 (change) and from 0.83 (future-future control) to 0.97 (prospective change) for the subscales (Lineweaver & Hertzog, in press).

For both the PBMI and the GBMI, one of the items was modified for the Indian population to better reflect the apparent cultural differences (Ability to remember where the car has been parked). This statement was viewed to be irrelevant for many Indians as they do not own cars. Furthermore, parking lots are highly uncommon, thus, for those who have cars, forgetting would occur less frequently. This statement was changed to "Ability to remember where one's keys have been placed". This statement was viewed as more appropriate given that keys are more universally common.

Brief Visuospatial Memory Test. According to Lezak, (1983) a comprehensive memory assessment involves evaluating the span of immediate retention and learning which includes extent of recent memory, learning capacity and how well newly learned material is retained; and efficiency of retrieval of both recently learned and long-stored information.

The Brief Visuospatial Memory Test (BVMT) (Benedict, 1988), a multiple form visual memory test, meets the requirements detailed by Lezak. In this study, Form 1 was used in the memory assessment. The BVMT provided measures of immediate recall, learning or rate of acquisition, delayed recall and delayed recognition. In addition, the BVMT was selected because it is a visual memory test and thus was considered to translate more accurately across cultures then a language-based memory measure. Finally, reliability for this measure was fairly good. The test-retest reliability coefficient for Form 1 of this measure was 0.70 for trial 1, 0.72 for trial 2, 0.95 for trial 3, 0.86 for total recall and 0.87 for delayed recall.

The test procedure involved providing the participant with a pencil and sheet of unlined paper and asking them to concentrate on the point where the stimulus would be shown. When the participant was fully prepared, the 2 x 3 matrix of 6 designs was presented for 10 seconds. The participant was then asked to reproduce as many of the designs as possible, in the same location as they appeared on the display. This sequence was repeated while the participant completed two additional learning trials. Delayed recall and recognition were then assessed following a 25-minute period of distracting, intervening tasks. For the recall task, the participants were asked to draw

the 2x3 matrix of designs from memory. The recognition task was then administered by showing the participants a series of 12 patterns, 6 of which were the original designs. The participants were asked whether they recognize any of the designs as being one of the original designs.

In terms of scoring this measure, each of the six drawings was awarded full credit (2 points) if it was both accurately drawn and correctly located on the response sheet. In addition, given that this measure was developed as a memory test, slight inaccuracies (e.g. crooked lines and minor distortions) were ignored when scoring the designs. The score on the initial trial was the measure of initial recall. The best score from trial two or trial three minus the initial trial score was the score for rate of acquisition or learning. Further, delayed recall was measured by the score from the delayed recall trial. Finally, the delayed recognition score was the number of designs that the participants correctly recognized as either being either one of the original designs or not being one of the original designs

Culture Fair Intelligence Test. Since performance on intelligence tests is highly correlated with memory performance, the Culture Fair Intelligence Test (CFIT) (Cattell & Cattell, 1960) was administered in order to obtain a measure of intelligence. The scores from the CFIT served to enable a comparison between groups in order to assess the comparability of the groups with regards to intelligence as measured by this instrument

The CFIT attempts to measures the most consistent core of basic mental capacity or general intelligence across varying ranges of social background, school

achievement and cultural influences. In other words, the CFIT attempts to separate the individual's real general ability from other effects such as the effect of better or poorer local schooling and social class, which at present introduce a substantial error into assessments.

There are three different versions of the CFIT. Each version has been designed for a specific age group and/or education level. Scale 3 was selected for this study because is was designed for an adult population that has had some level of high school education. The other two scales were developed for adults with limited education and children under the age of 13. The Scale 3 CFIT test is made up of four subtests which are: Series, Classifications, Matrices, Condition (topology). The first sub-test, the Series sub-test, asks the participant to select the correct pattern from a choice of five patterns that continues the existing series of patterns. The Classifications subtest involves identifying the pattern from a choice of five patterns which is different in some way from the others. Matrices is a 2 x 2 matrix made up with patterned boxes with one empty box. To the right of the matrix the participant is asked to select one box out of a choice of five which will complete the matrix. Finally, in the Condition subtest a series of conditions exist in a boxed pattern. Using these conditions, the participant must select the correct box out of a choice of five boxes. Each of these subtests were timed. The time allotted per subtest is 3 minutes, 4 minutes, 3 minutes and 2 ½ minutes respectively. The total test administration took approximately 20 - 30 minutes, depending on how readily the participants comprehended the instructions. The internal

reliability for this measure is also quite good (test-retest reliability coefficient =0.82; Chronbach's alpha = 0.87).

Procedure

All procedures in this study were in accordance with the ethical guidelines of the Canadian and American Psychological Associations. Each participant was tested individually with approximate testing times ranging from one and one-half hour to two and one-half hours. The testing was conducted in a location that the participants reported was the most comfortable and convenient. Locations included the participant's home, university settings and local community centers. The majority of the testing was conducted in the participant's home and in the university setting. All participants interested in participating in the study were informed that the purpose of the study was to investigate people's beliefs about memory and memory performance. They were asked to read a consent form which described to them the purpose of this study and included information regarding participant' rights to refuse to answer any questions, to withdraw at any time, and information regarding confidentiality and anonymity of their responses (see Appendix A).

Once the participants had given informed consent, they were asked to complete a questionnaire relating to demographics, health and other background information (see Appendix B). Participants then completed the Personal Beliefs about Memory questionnaire (see Appendix C) and General Beliefs about Memory questionnaire (see Appendix D). Following these questionnaires, the participants were administered the Brief Visuospatial Memory Task (BVMT) (see Appendix E). As part of the

administration of the BVMT, a 25 minute pause is required before a measure of memory recall and memory recognition can be obtained. During this 25 minutes delay period, the participants were administered the Culture Fair Intelligence test (see Appendix F). Following the administration of the Culture Fair Intelligence test, the delayed memory recall and the memory recognition components of the BVMT were administered. At the conclusion of the research session, the participants were provided with a debriefing statement, including a more detailed description of the study and a means of contacting the researcher for further information if the participants were interested (see Appendix G).

Results

The results of this study are reported in four sections. First, an analysis was conducted on a number of descriptive demographic characteristics of the groups such as age, education, health and martial status in order to ensure that the groups were matched. Second, an analysis of personal beliefs and general beliefs about memory was conducted for the four groups. Third, an analysis of memory performance was conducted. Because intelligence is highly correlated with memory performance, intelligence scores were used as a covariate for the memory performance analyses. Finally, the relationship between memory beliefs and memory performance was examined.

Demographic Characteristics of the Group

As noted earlier, an attempt was made to acquire comparable groups when selecting participants for this study. Examination of the variables descriptive of the groups, suggests that, on the whole, the participants were similar on many dimensions. A 2 X 2 between subjects multivariate analysis of variance (MANOVA) was conducted in order to assess the effects of Cultural Group (Indian versus Canadian) and Age Group (young versus old) on the following dependent variables: age, years of education, self-reported overall health when compared to a perfect state of health (perfect health comparison), self-reported overall health when compared to others in the participants' age group (relative health comparison), severity of illness in the four weeks prior to testing (recent illness), number of visits to physician in past year, and level of chronic health concerns.

The multivariate F-test showed significant main effects for Age Group Wilks' $\lambda = 0.024$, $F(7, 110) = 648.053$, $p < .001$. Examination of the univariate F- tests revealed significant effects for age , $F(1, 116) = 4320.37$, $p < .001$, $\eta^2 = .9739$, perfect health comparison , $F(1, 116) = 2.70$, $p < .019$, $\eta^2 = .0466$, recent illnesses, $F(1, 116) = 27.08$, $p < .014$, $\eta^2 = .0513$, and chronic illnesses , $F(1, 116) = 147.41$, $p < .001$, $\eta^2 = .0121$. Thus, as would be expected, there was a significant difference in age between the young participants and the old participants. Also, the older participants reported having relatively poorer health when compared to a perfect state of health than the younger participants. In addition, the older groups reported having significantly more illnesses, injuries or health problems in the four weeks prior to testing than the younger group. Finally, the older participants reported suffering from significantly more chronic illnesses than the younger participants. The younger and older groups were not significantly different with regards to years of education, self-reported relative health, and number of visits to a physician/year.

An overall significant main effect for Cultural Group Wilks' $\lambda = 0.181$, $F(7, 110) = 3.48$, $p = .002$ was also found. Further examination of the univariate F-tests showed that there were cultural differences in the number of visits to a physician/year $F(1, 116) = 5.68$, $p < .019$, $\eta^2 = .0467$. Canadians reported that they visited their physician more frequently than the Indian participants. No significant differences between the two cultural groups were found for age, number of years of education, perfect health comparison, relative health comparison, recent illnesses and level of chronic illnesses.

Finally, the MANOVA analysis revealed a significant interaction effect of Age Group and Cultural Group, Wilks' $\lambda = 0.858$, $F(7, 110) = 2.59$, $p=.016$. The univariate F-tests showed a significant interaction effect for two dependent variables: Total number of visits to the physician in the last year and level of chronic illness, $F(7, 110) = 5.69$, $p=.019$, $\eta^2 = .0467$, and $F(7, 110) = 4.63$, $p=.033$, $\eta^2 = .0384$, respectively. Post hoc tests were conducted in order to get a clearer picture of the interaction effects between age and cultural groups. For the post hoc analysis, the Scheffé's procedure was utilized because it is the most conservative and the most flexible of the popular methods (Tabachnick & Fidell, 1989). The Scheffé's post hoc analysis ($p < .05$) revealed that the older Canadian participants visited their physician significantly more in the year prior to testing than all other groups which did not differ. In the case of chronic illness, the post hoc analysis revealed that the old Indian participants reported significantly higher levels of chronic illness than both of the younger groups; however, the old Indian group reported significantly lower levels of chronic illness than the old Canadian group.

The participants were also assessed by age group and cultural group on a number of discrete variables namely, degree obtained or were in the process of obtaining at the time of testing, marital status, occupational status at the time of testing, and description of majority of life-time employment. A Chi-square analysis revealed that there was a significant difference between young and old participants in level of education/degree obtained $\chi^2(3, N = 60) = 14.795$, $p< .002$. A smaller percentage of young participants (20%) had ended their formal education at grade 12 whereas a

larger percentage (40%) of the old participants' maximum formal education was up to a grade 12 level. In addition, younger participants were more likely to have completed or to be in the process of completing an undergraduate degree than the older participants (56.7% versus 23.3%). Conversely, a greater number of older adults had completed a graduate degree (28.3%) when compared to the younger adults (15.0%). One feasible explanation the latter difference may be that the younger participants were still in the process of completing their education; hence they had not achieved their highest level of formal education. A Chi-square analysis examining the cultural grouping and level of education/degree obtained revealed no significant differences. In other words, the Indian participants were no different than the Canadian participants with regards to level of education/degree obtained. Thus the cultural groups appear to be matched with regards to degree obtained.

The Chi-square analysis also revealed a significant difference between young and old participants with regards to marital status $\chi^2(2, \underline{N} = 60) = 93.774$, $p < .001$. The majority of the young participants were single (93.3%) with the remaining participants being married (6.7%) at the time of testing. On the other hand, the majority of older participants were married (85%) with a minority being single (5.0%). The remaining older participants described themselves as being widowed (10%). No significant differences were found with regards to marital status between the two cultures.

Differences in occupations held at the time of testing were found between young and old participants $\chi^2(4, \underline{N} = 60) = 116.80$, $p < .001$. The majority of the older

participants reported that they were retired (98.3%) and a small minority reported that they were employed full-time (1.7%). On the other hand, the majority of the young participants reported that they were students (86.7% full-time students; 1.7% part-time students), and the remaining participants were either employed full time (6.7%), or described themselves as "other" (5.0%). No significant difference between the two cultures were found on the current occupation variable.

Finally the Chi-square analysis revealed significant age difference in a variable which asked the participants to identify type of employment they had held for the majority of their life time $\chi^2(4, \underline{N} = 60) = 116.80$, $p < .001$. Over half of the older participants (55%) described their life-time employment as being professional, 18.3% identified themselves as being technical/trade specific, 21.7% as reported that their life-time employment was semi-skilled, 3.3% described their careers as labour related and 1.7% circled the "other" category. The majority of the younger participants, on the other hand, identified their life-time employment as being "other" (86.7%) and further specified "student" as this other category. Of the remaining young participants 8.3% described their life-time employment as being professional and 5.0% described their employment history as labour related. As with all the other discrete descriptive variables there was no significant difference in this variable between the two cultural groups.

Thus, from the MANOVA and Chi-square analyses, it appears that the Canadian participants and Indian participants were fairly well matched. Only one variable, number of visits to a physician/year, was identified as having a significant main

effect for cultural grouping. As would be expected, there were differences between young and old participants. Generally, the old participants reported being poorer on many of the health variables than the young participants. In addition, more of the older participants reported being married and having a history of employment whereas most of the young participants reported that they were single and students. Finally, although number of years of education did not vary significantly between young and old participants, the level of education or degree obtained did vary. This difference may be a function of the younger participants still being students and hence still completing their education.

Memory Beliefs

Personal beliefs about memory. As detailed earlier, questions from the Personal Beliefs about Memory Instrument (PBMI) were categorized into three broad memory domains, namely memory efficacy, memory change and control over memory. Memory efficacy was further dimensionalized into two constructs: (1) Global Memory Efficacy, and (2) Specific Memory Efficacy. Change in memory was dimensionalized into: (1) Retrospective Change, and (2) Prospective Change. Finally, control was examined within three temporal perspectives: (1) Present Control Over Present Functioning , (2) Present Control Over Future Functioning, and (3) Future Control Over Future Functioning. A 2 x2 between subjects multivariate analysis of variance (MANOVA) was conducted to assess for the effects of Cultural Groups and Age Groups on the seven dimensionalized constructs identified in the PBMI.

The results from the multivariate F-test showed a significant main effect for Cultural Group (Indian versus Canadian) Wilks' $\lambda = .765$, $F(7, 110) = 4.81$, $p < .001$. The means, standard deviation scores and a measure of the strength of the relationship (η^2) for the memory constructs for the Indian and Canadian participants are detailed in Table 2. The univariate F- test revealed significant effects for Global Memory Efficacy, and Specific Memory Efficacy, $F(1, 116) = 20.53$, $p < .002$ and $F(1, 116) = 7.49$, $p < .041$ respectively. As shown in table 2, the Indian participants had higher average scores on the Global Memory Efficacy and Specific Memory Efficacy dimensions than the Canadian participants.

The univariate F-tests also revealed significant effects for both Retrospective Change $F(1, 116) = 17.10$, $p < .002$ and Prospective Change $F(1, 116) = 22.15$, $p < .001$. As was the case with the memory efficacy constructs, the Indians reported higher scores for Retrospective Change and Prospective Change than the Canadian participants, indicating a belief in less decline with increasing age (see Table 2).

Finally, the univariate F-test showed a significant effect for one of the memory control constructs, namely Present Control Over Present Functioning , $F(1, 116) = 22.62$, $p < .037$. However, in this case, the Canadian participants scored higher on this control construct than the Indian participants.

The multivariate F-test also showed a significant main effect for Age Group (young versus old) Wilks' $\lambda = .598$, $F(7, 110) = 9.37$, $p < .001$. The univariate F-tests showed significant effects for Global Memory Efficacy $F(1, 116) = 9.92$, $p < .032$, Specific Memory Efficacy $F(1, 116) = 12.56$ $p < .008$, Retrospective Change $F(1, 116) =$

93.63, p <.001, Prospective Change F(1, 116) = 87.63, p <.001 and Future Control Over Future Functioning F(1, 116) = 12.56, p <.008. The young participants reported higher scores than the older participants on all of these constructs. The means and standard deviation scores and eta squared for the memory constructs for both young and old participant are shown in Table 3.

Table 2

Mean, Standard Deviation, p-values and η^2 for Memory Constructs by Cultural Group.

	Indian Participants (n=60)		Canadian Participants (n=60)		p-value	η^2
Memory Constructs	M	SD	M	SD	p	η^2
Global Memory Efficacy	7.20	1.52	6.37	1.43	.002	.0774
Specific Memory Efficacy	6.97	1.39	6.47	1.32	.041	.0357
Retrospective Change	5.97	1.80	5.21	1.38	.002	.0762
Prospective Change	5.37	1.62	4.51	1.45	.001	.1053
Present Control Over Present Functioning	6.89	1.83	7.76	2.61	.037	.0369
Present Control Over Future Functioning	6.33	1.71	6.10	1.71	.426	.0055
Future Control Over Future Functioning	6.03	1.72	6.17	1.32	.609	.0022

Finally, the results from the multivariate F-test also revealed a significant interaction effect of Age Group by Culture Group, Wilks' λ = .856, F(7, 110) = 2.65, p

<.014. The univariate F-tests revealed a significant interaction effect for two variables: Present Control Over Future Functioning $F(1, 116) = 25.21$, $p < .002$, and Future Control Over Future Functioning $F(1, 116) = 9.42$, $p < .036$. Figure 1 depicts the Present Control Over Future Functioning interaction and Figure 2 depicts the Future Control Over Future Functioning interaction.

Table 3

Mean, Standard Deviation, p-value and η^2 for Memory Constructs by Age Group.

Memory Constructs	Young Participants (n=60)		Old Participants (n=60)		p-value	η^2
	M	SD	M	SD	p	η^2
Global Memory Efficacy	7.07	1.33	6.50	1.67	.032	.0389
Specific Memory Efficacy	7.04	1.37	6.40	1.30	.008	.0584
Retrospective Change	6.47	1.52	4.70	1.24	.001	.3111
Prospective Change	5.80	1.4	4.08	1.29	.001	.3176
Present Control Over Present Functioning	7.60	1.56	7.04	2.82	.173	.0159
Present Control Over Future Functioning	6.36	1.74	6.06	1.51	.308	.0089
Future Control Over Future Functioning	6.56	1.42	5.63	1.50	.001	.0971

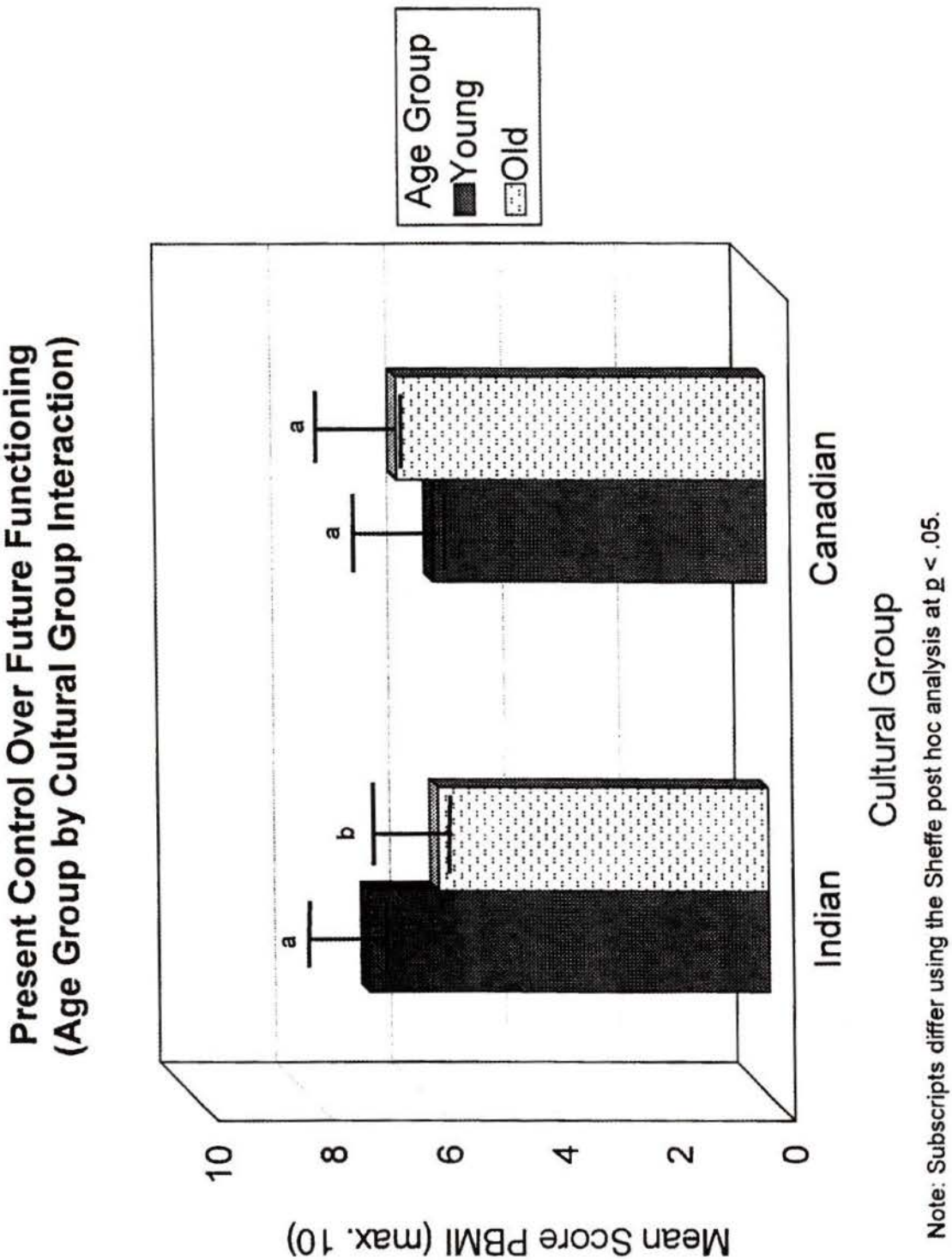


Figure 1: Present Control Over Future Functioning Interaction

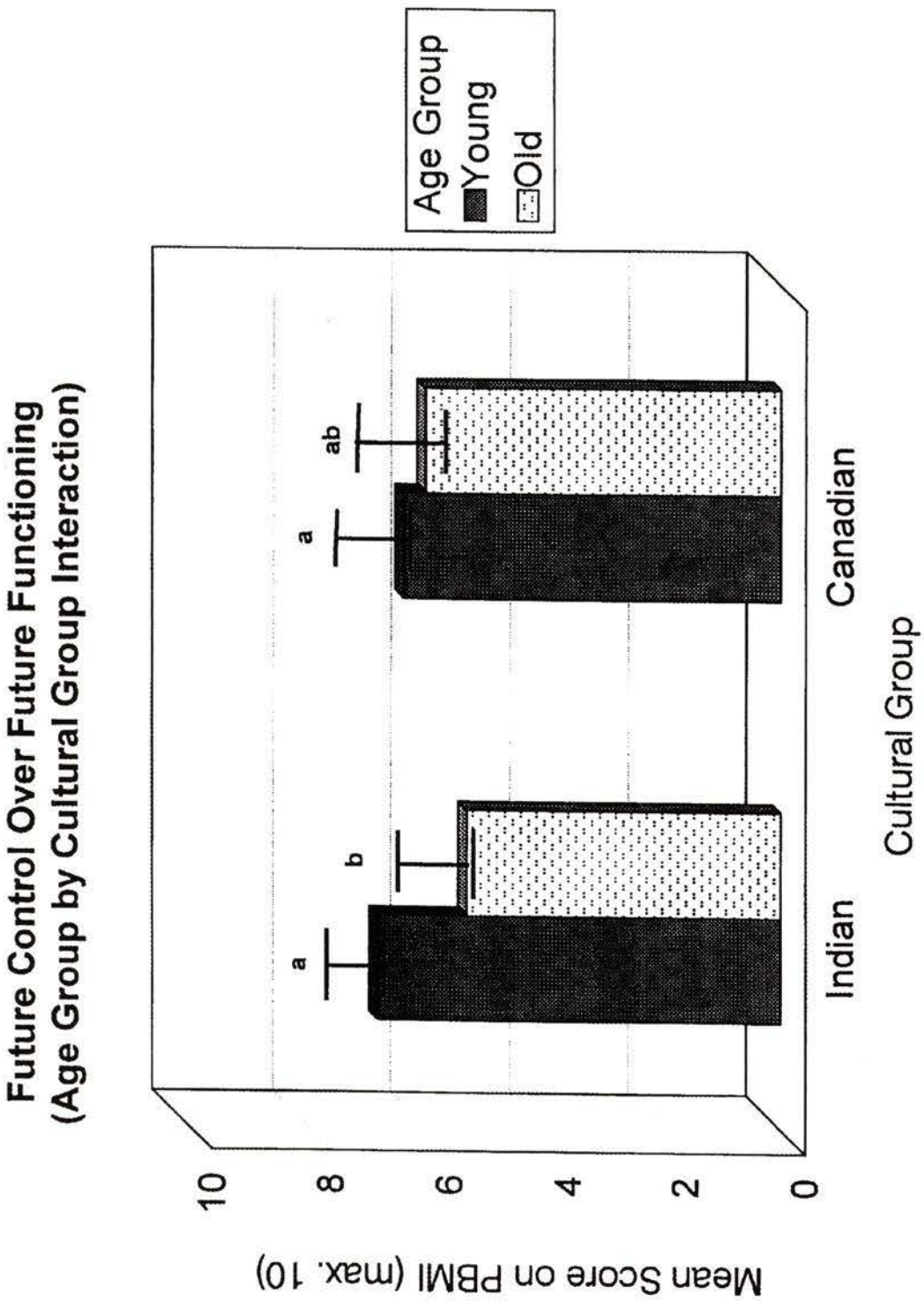


Figure 2: Future Control Over Future Functioning Interaction

A Scheffé's post hoc test was conducted in order to get a clearer picture of the interaction effects between Age Groups and Cultural Groups. The Scheffé's post hoc analysis ($p = .05$) revealed that the young Indian group recorded significantly higher scores on the Present Control Over Future Functioning construct ($M = 6.93$, $SD = 1.65$) than the old Indian group ($M = 5.72$, $SD = 1.57$); however the young Indian group was not significantly different than either of the young or old Canadian groups ($M = 5.78$, $SD = 1.67$; $M = 6.41$, $SD = 1.38$, respectively). In addition, on the Future Control Over Future Functioning construct, the post hoc analysis revealed that the old Indian group had significantly lower scores ($M = 5.29$, $SD = 1.61$) than both the young Indians and young Canadians ($M = 6.78$, $SD = 1.51$ and $M = 6.35$, $SD = 1.32$, respectively). However the scores for old Indians participants were not significantly different than the old Canadian participants ($M = 5.98$, $SD = 1.31$).

General beliefs about memory. For each of the 27 questions on the General Beliefs about Memory Instrument (GBMI), the participants were asked to rate how they thought a relatively healthy adult representing each age group from 20 to 90 (in increments of 10) would perform. As noted earlier, the GBMI posed questions about two of the three memory domains explored in the PBMI, memory efficacy and memory control. Memory efficacy was further dimensionalized into two constructs: (1) Global Memory Efficacy (beliefs about memory or remembering in general), and (2) Specific Memory Efficacy (beliefs about any particular class of things that could be remembered, such as names or where an everyday object has been placed). Memory control was explored within two temporal perspectives: (1) Present Control Over

Present Functioning (control over performance), and (2) Present Control Over Future Functioning (control over change).

A comparison between groups examining the effects of culture (Indian and Canadian) and Age Group(young and old) for each dependent variable was conducted using repeated measures analysis of variance and orthogonal polynomial trend analysis. The results of the analysis for the memory efficacy constructs and the control dimensions are summarized in Table 4. Due to the violation of sphericity assumption as reflected by the Mauchly's Test of Sphericity, all repeated measures effects were assessed using the significance level from multivariate tests at alpha = .05 (Wilks' Lambda; see Hertzog & Rovine, 1985).

Polynomial trends across target age were investigated from the first to the fourth power. Table 4 shows the trends that were significant for each of the memory efficacy constructs and control constructs. It should be noted that all the memory efficacy and control dimensions showed at least a concave-downward quadratic trend in the total sample aggregate function. This is reflected in the significant negative linear and quadratic trends. All of the dimensions examined also showed significant cubic and/or quartic trends. These effects, however, were not associated with nonmonotonic bumps in the developmental function. Instead, they depict the tendency for greater linear decline in late life than would be predicted by a polynomial function with only linear and quadratic trend components.

On the Global Memory Efficacy dimension, there was a significant between-subjects main effect for Age Group (refer to Table 4). This suggests that on average,

the old participants reported reliably higher scores on this dimension than the young participants. In addition there was a main effect for Target Age which was moderated by the interaction of Target Age by Age Group. This interaction is depicted in Figure 3, and it suggests that shape of the aggregate functions differed depending on the age group responding to them. At target age 20, the young participants gave higher ratings on the Global Memory Efficacy dimension than the old participants. At target age 30, both the young and old participants gave the same average response scores. From target age 40 and thereafter, the old participants reported higher scores on the Global Memory Efficacy dimension than the young participants as a function of target age.

Table 4

Significant Multivariate Analysis and Trend Analysis Results for Memory Efficacy and Memory Control Constructs

Global Memory Efficacy						
Significant Effects	Wilks' λ Value	df	Error df	F	p	η^2
CG[1]					N.S.	
AG[2]		**1.00**	**116.00**	**8.773**	**.004**	**.070**
TA[3]	**.170**	**7.00**	**110.00**	**76.525**	**.000**	**.830**
Linear		1	116	484.20	.000	.807
Quadratic		1	116	121.10	.000	.511
Cubic		1	116	12.42	.001	.096
Quartic		1	116	4.79	.030	.040
TA x CG					N.S.	
TA X AG	**.785**	**7.00**	**110.00**	**4.306**	**.000**	**.251**
Linear		1	116	5.26	.024	.043
Quadratic		1	116	14.64	.000	.112
Cubic		1	116	4.81	.030	.040
TA X C X AG					N.S.	

[1]CG = Cultural Group **[2]AG = Age Group** **[3]TA = Target Age**

Table 4 (cont'd)

Significant Multivariate Analysis and Trend Analysis Results for Memory Efficacy and Memory Control Constructs

Specific Memory Efficacy

Significant Effects	Wilks' λ Value	df	Error df	F	p	η^2
CG					N.S.	
AG					N.S.	
TA	**.090**	**7.00**	**106.00**	**152.81**	**.000**	**.910**
Linear		1	112	752.01	.000	.870
Quadratic		1	112	263.72	.000	.702
Cubic		1	112	22.25	.000	.166
Quartic		1	112	10.70	.001	.087
TA X CG	**.678**	**7.00**	**106.00**	**7.201**	**.000**	**.322**
Quadratic		1	112	22.27	.000	.166
Cubic		1	112	18.02	.001	.139
Quartic		1	112	5.19	.024	.044
TA X AG	**.785**	**7.00**	**106.00**	**4.306**	**.000**	**.213**
Linear		1	112	6.83	.010	.057
Quadratic		1	112	12.98	.000	.104
Cubic		1	112	12.26	.001	.099
TA X CG X AG	**.862**	**7.00**	**106.00**	**2.430**	**.000**	**.138**
Quartic		1	112	8.05	.005	.067

Present Control over Present Memory

Significant Effects	Wilks' λ Value	df	Error df	F	p	η^2
CG[1]					N.S.	
AG[2]					N.S.	
TA[3]	**.185**	**7.00**	**110.00**	**69.015**	**.000**	**.815**
Linear		1	116	397.39	.000	.774
Quadratic		1	116	94.47	.000	.449
Cubic		1	116	20.22	.001	.148
Quartic		1	116	6.38	.013	.052
TA X CG					N.S.	
TA X AG					N.S.	
TA X CG X AG					N.S.	

[1]CG = Cultural Group **[2]AG = Age Group** **[3]TA = Target Age**

Table 4 (cont'd)

Significant Multivariate Analysis and Trend Analysis Results for Memory Efficacy and Memory Control Constructs

Present Control over Future Functioning

Significant Effects	Wilks' λ value	df	Error df	F	p	η^2
CG					N.S.	
AG					N.S.	
TA	**.171**	**7.00**	**109.00**	**75.494**	**.000**	**.829**
Linear		1	115	448.24	.000	.796
Quadratic		1	115	129.86	.000	.830
Cubic		1	115	23.54	.000	.170
Quartic		1	115	5.37	.022	.045
TA X CG	**..875**	**7.00**	**109.00**	**2.229**	**.037**	**.125**
Linear		1	115	6.39	.013	.153
Cubic		1	115	8.97	.003	.072
TA X AG					N.S.	
TA X CG X AG	**.867**	**7.00**	**109.00**	**2.381**	**.026**	**.133**
Quartic		1	115	5.64	.019	.047

[1]CG = Cultural Group **[2]AG = Age Group** **[3]TA = Target Age**

In terms of the pattern of decline, from target age 20 to 40 the old participants response scores were fairly consistent. Hence the pattern is somewhat flat initially. After target age 40, however, the response scores for the old participants begin to decline. Also, the rate of decline depicted by the old participants' responses is slower than the young participants. The young participants' responses, on the other hand, show a more linear declining pattern. This is reflected in the trend analysis which is defined largely by a quadratic trend, but also shows a significant linear, and cubic trend. Again, it should be noted that the cubic trend simply reflects the tendency for more linear decline in late life and it is not associated with nonmonotonic bumps in the developmental function.

In the analysis of the Specific Memory Efficacy dimension, a significant Target Age and Target Age by Age Group interaction also emerged (see Figure 4). For target age 20 and 30, the young participants tended to rate specific memory ability higher than old participants. At target age 40, the response scores for both young and old were fairly similar and from target age 50 to 90, the old participants reported higher response scores than the young participants. The young participants response scores reflected a pattern which showed slower declines for target age 20 to 40, however after target age 40 the rate of decline is shown to increase. For the old participants, the overall rate of decline is considerably slower than that of the young. In addition, the pattern depicted by the old participants response scores show a slower rate of decline for target ages 20 to 40 at which point the rate of decline appears to increase. The corresponding trend analysis for this interaction shows significant linear, quadratic, cubic and quartic trends.

A significant Target Age by Culture interaction was also found for the Specific Memory Efficacy dimension. This interaction indicates that there were cultural differences in the pattern of responses on this dimension. An interesting distinction between the Indian and Canadian participants can be seen in Figure 5. On average, the response scores of the Canadian participants reflect a declining linear trend, with the highest response scores for target age 20 and the lowest ratings for target age 90. The response pattern for the Indian participants, on the other hand, seems to be more curvilinear with response scores for the 20 year old target age being slightly lower than that for target age 30. From target ages 30 to 40, the responses of the Indian group begin to reflect a slow decline and after target age 40, memory scores appear to decline

more rapidly to target age 90. Hence, it appears Indian participants believe that memory abilities are poorer for twenty year olds and that memory ability peaks at age thirty, after which it begins to decline. Canadian participants, on the other hand, appear to believe that memory ability is at its highest at age twenty and thereafter, memory abilities begin to decline. The trend analysis for the target age by Culture interaction shows a significant quadratic, cubic and quartic trend. The trend, however, is mainly defined by its linear and quadric function.

On the Specific Memory Efficacy dimension, there was also a significant Target Age by Culture by Age Group interaction which is shown in Figure 6. This interaction indicates that age group and cultural group interact in determining the pattern of responses on this dimension. When looking at Figure 6, it appears that the young and old Canadian participants had more similar response patterns than the young and old Indian participants. Both the young and old Canadians reported the highest scores for target age 20 with the scores declining as a function of target age thereafter. The young Indians, on the other hand reported the slightly higher scores for target age 30 when compared to target age 20. After target age 30, the young Indian participants responses also reflected a declining pattern as a function of age. The old Indians, reported the highest scores for target age 40. Their next highest response score was for target age 30. The old Indian participants also reported the performance of 20 years olds as slightly higher than that of 50 year olds. Following target age 50, the response scores of the old Indians show a rapid decline. The trend analysis for this interaction reveal a significant quartic trend.

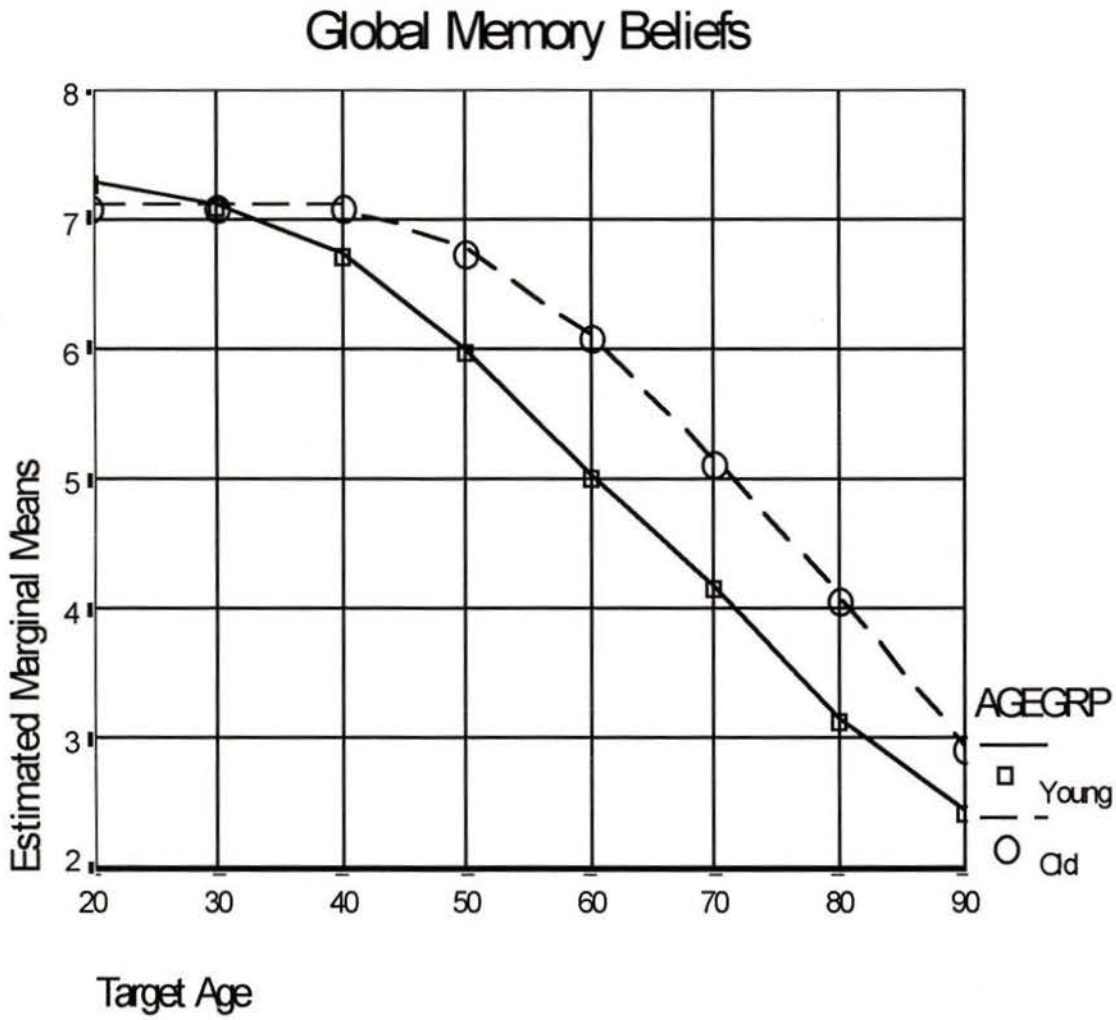


Figure 3: **Interaction of Target Age by Age Group on the Global Memory Efficacy Beliefs dimension.**

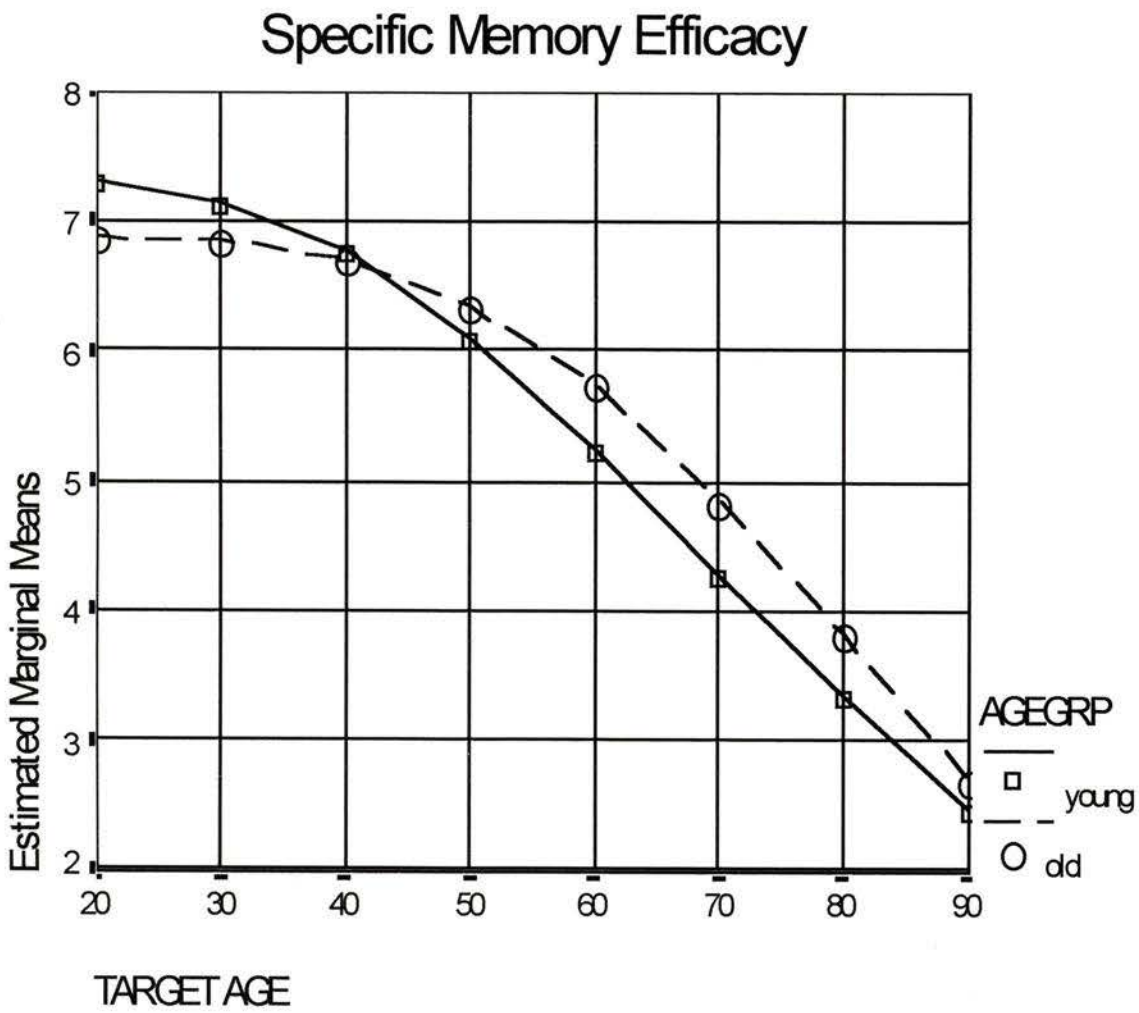


Figure 4: **Interaction of Target Age by Age Group on the Specific Memory Efficacy Beliefs dimension.**

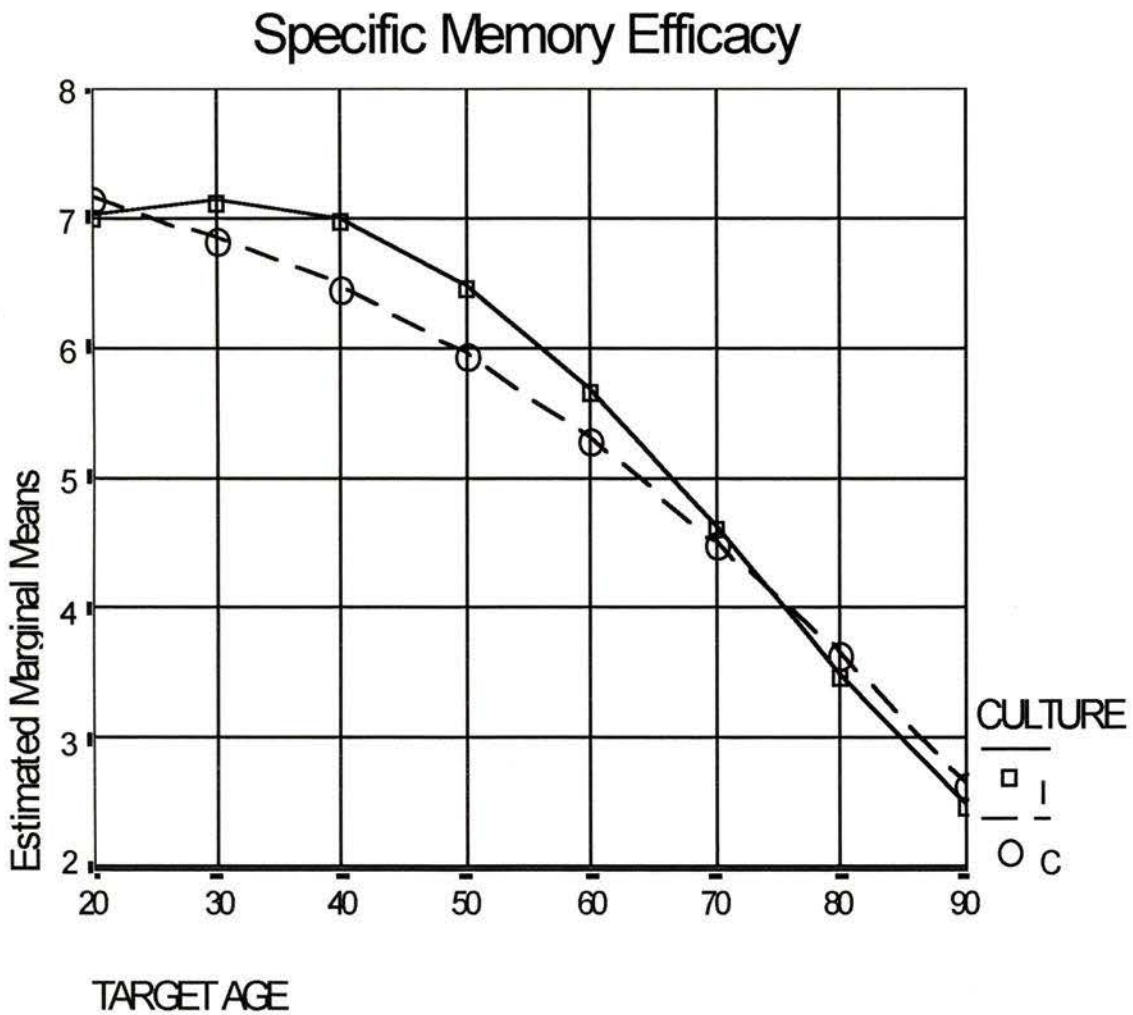
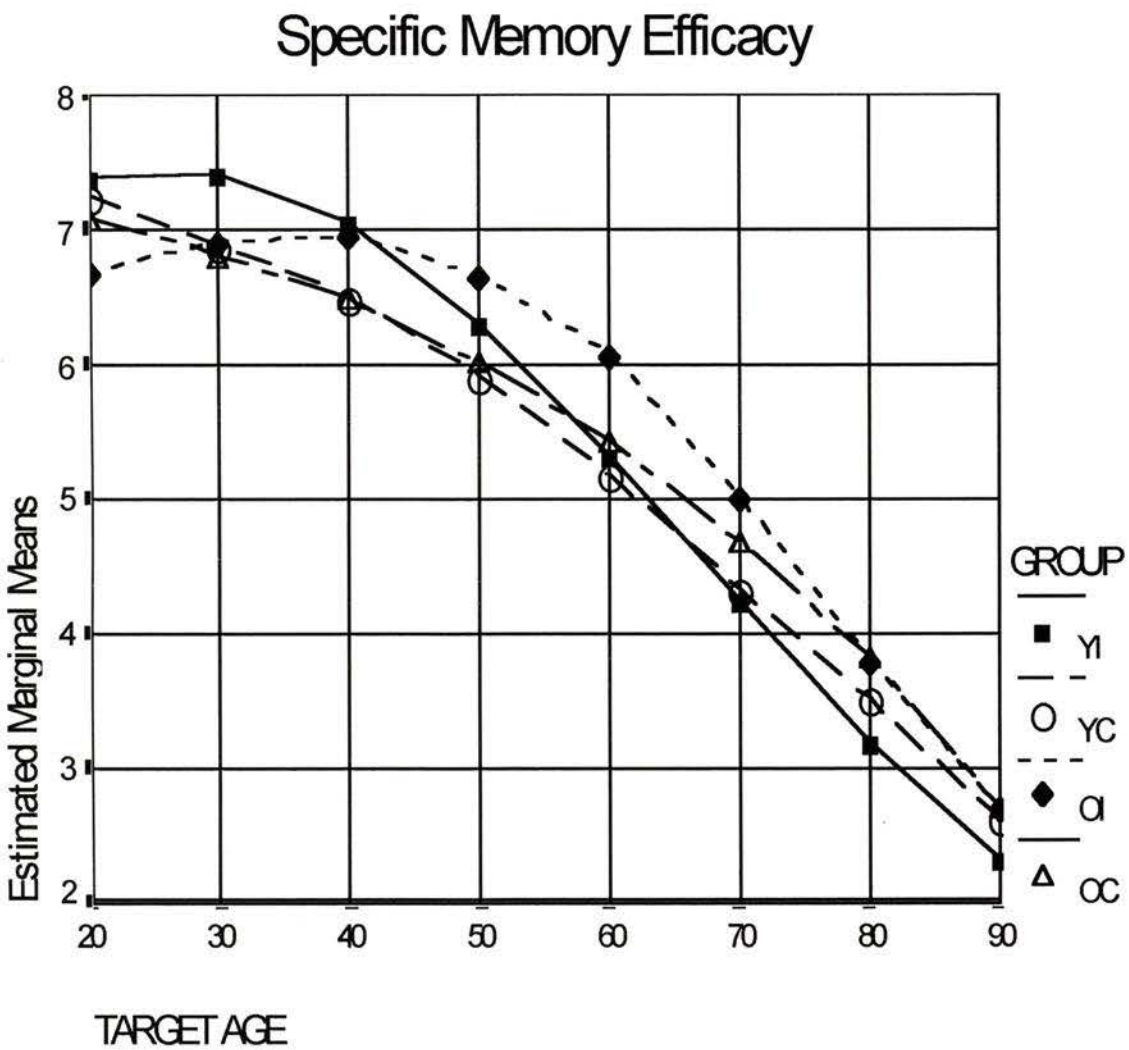
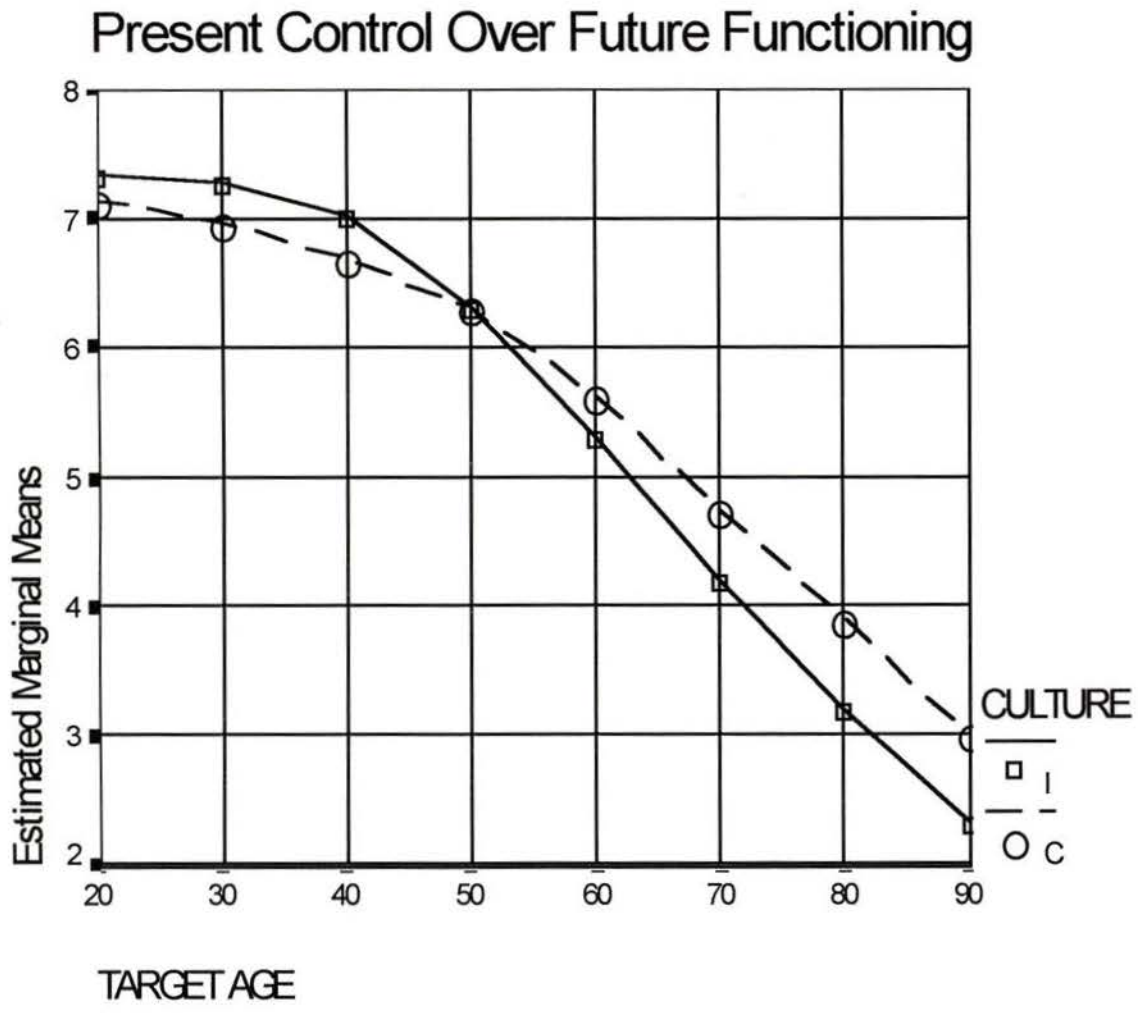


Figure 5: **Interaction of Target Age by Culture Group on the Specific Memory Efficacy Beliefs dimension.**



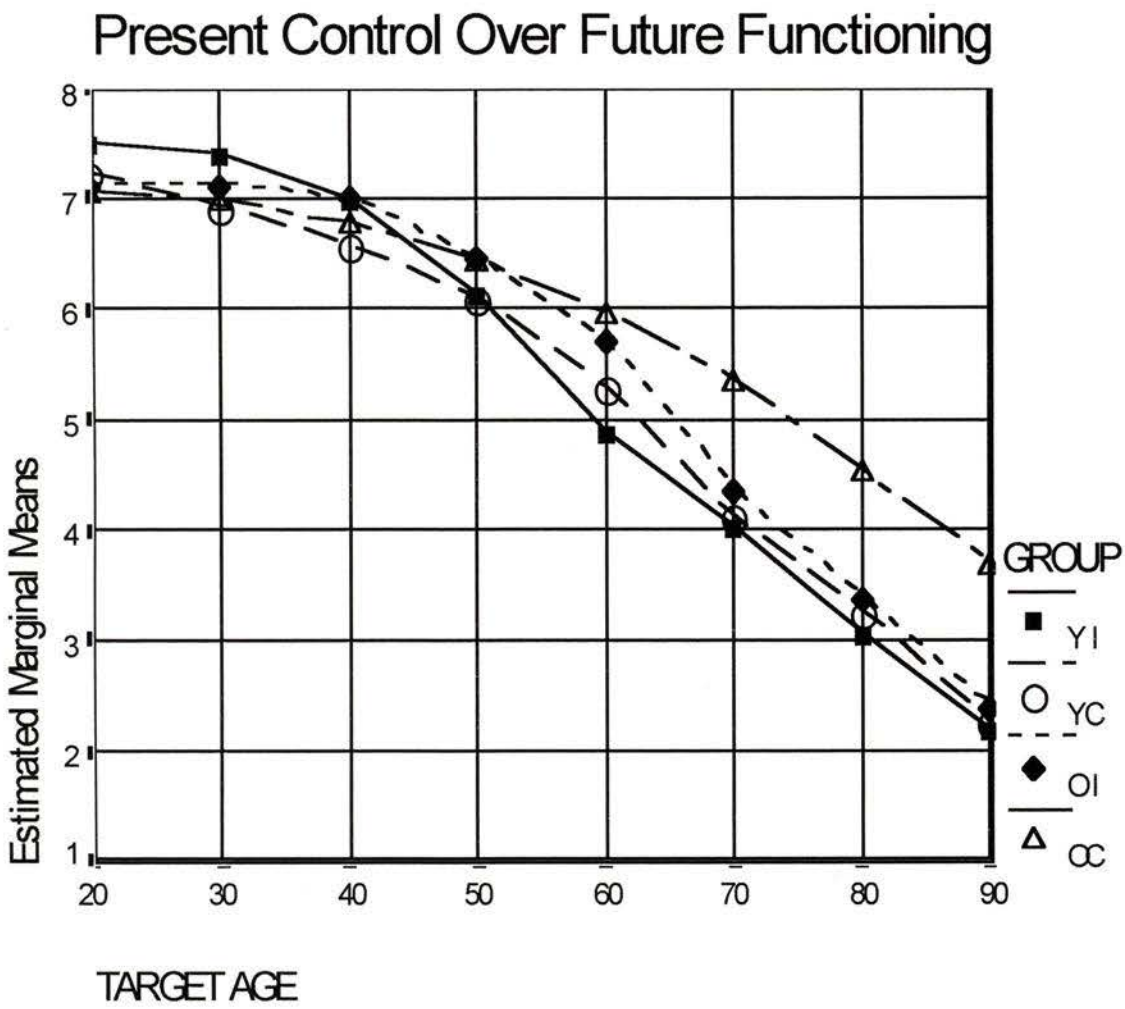
YI =Young Indians
YC =Young Canadians
OI = Old Indians
OC =Old Canadians

Figure 6: **Interaction of Target Age by Culture Group by Age Group on the Specific Memory Efficacy Beliefs dimension.**



I = Indian Group
C = Canadian Group

***Figure 7*: Interaction of Target Age by Culture Group on the Present Control over Present Memory dimension.**



YI =Young Indians
YC =Young Canadians
OI = Old Indians
OC =Old Canadians

***Figure 8*: Interaction of Target Age by Culture Group by Age Group on the Present Control over Present Memory dimension.**

On the Present Control over Present Memory dimension, only a significant main effect of Target Age emerged. The trend analysis depicts a significant linear, quadratic, cubic and quartic trend for Target Age. On the Present Control over Future Functioning dimension, on the other hand, in addition to there being a significant main effect for Target Age, there was a significant Target Age by Culture and a significant Target Age by Culture by Age Group interaction (see Figures 7 and 8, respectively). With regards to the Target Age by Culture interaction, it appears that the Indian participants reported higher response scores for target ages 20 to 40 than their Canadian counterparts. At target age 50 the response scores for Indians and Canadian was similar; however from target age 60 to 90, the Canadians reported higher scores than the Indians. Thus, when comparing the Indians with the Canadians, the pattern of responses suggest that the Indians believe that in early adulthood and early middle age people have more control in the present over future memory functioning than the Canadians; however, after age 60, the Indian respondents hold lower beliefs in future control over present functioning than the Canadian participants. The trend analysis for this interaction shows significant linear and cubic trend.

The significant Target Age by Culture by Age Group interaction suggests that cultural grouping and age group interact in determining the pattern of response on this dimension. When viewing Figure 8, it appears that the old Canadians were most optimistic about controlling change in late life. From target age 60 to target age 90, the old Canadian participants reported higher scores than the young Canadian participants and both the young and old Indian participants on this dimension. The

young Indians, on the other hand, reported the highest scores for target age 20 and then their response scores revealed a declining pattern from target age 30 to target age 90. At target age 90, the young Indian's response scores were lower than both the young and old Canadian participants and the old Indian participants. Thus, it appears that the young Indians are the most optimistic about the ability to control future functioning in the 20s and 30s; conversely they are the least optimistic about controlling change in later years (from target age 60 to target age 90). The young Canadians highest response scores (at target age 20) were similar to the old Indian participants and the old Canadian participants and generally, their responses were similar to the young and old Indians from target age 60 and thereafter. For the most part, the young Canadian participants response scores depicted the most uniformly declining pattern on this dimension. Finally, the old Indian participants reported the highest control over future functioning at target age 30. In addition, the old Indians' scores for target age 20 and 40 were fairly similar. After target age 40 the old Indian participants' scores begin to show a declining pattern. The trend analysis on this dimension shows a significant quartic trend.

Analysis of Memory Performance

Before conducting an analysis of memory performance, an analysis of the intelligence scores was conducted in order to ascertain whether intelligence should be used as a covariate variable. Following this assessment, four types of memory were assessed using the scores from the Brief Visuospatial Memory Task (BVMT), namely, (1) immediate recall, (2) learning, (3) delayed recall and (4) recognition.

Analysis of Covariance for Intelligence Measure. Given that memory is highly correlated with intelligence (Lezak, 1983), a measure of intelligence was obtained as a potential covariate variable for the memory analysis. As detailed earlier, the Culture Fair Intelligence Test (CFIT) was administered to all the participants. The test is made up of four subtests: Series, Classifications, Matrices and Condition. Hence, four subtest scores were examined and these scores were summed to obtain an overall total score. The mean scores of all the participants on this measure are shown in Table 5.

From an examination of the mean scores, it appeared that the young Canadian participants had higher scores than their Indian counterparts. In addition the old Canadians also performed better than the old Indian participants. In order to assess whether these differences in mean scores were significant, a between subjects multivariate analysis of variance (MANOVA) was conducted with the Age Group (young versus old) and Cultural Group (Indian versus Canadian) as the independent variables and the four subtest scores on the CFIT as the dependent variables.

The multivariate F-test showed a significant main effect for Cultural Group Wilks' $\lambda = .793$, $F(4, 113) = 7.37$, $p<.001$, $\eta^2 = .207$ and a significant main effect for Age Group Wilks' $\lambda = .599$, $F(4, 113) = 18.90$, $p<.001$, $\eta^2 = .401$ The univariate F-test for Cultural Group revealed significant effects for all of the four CFIT subtests: $F(1, 116) = 42.01$ $p<.001$, $\eta^2 = .111$ for Subtest 1, $F(1, 116) = 23.41$ $p<.028$, $\eta^2 = .041$ for Subtest 2, $F(1, 116) = 72.08$ $p<.001$, $\eta^2 = .184$ for Subtest 3, and $F(1, 116) = 19.20$ $p<.006$, $\eta^2 = .064$ for Subtest 4.

Table 5

Mean scores and Standard Deviation Scores on the Culture Fair Intelligence Instrument.

Group		Subtest1	Subtest2	Subtest3	Subtest4	Total Score
Young Indians	M	6.17	5.63	4.27	4.30	20.37
(n = 30)	SD	1.72	2.27	1.26	1.37	4.92
Young Canadians	M	7.73	7.10	6.13	5.67	26.63
(n = 30)	SD	1.64	2.50	1.83	1.92	5.45
Old Indians	M	4.63	3.77	2.30	3.30	14.00
(n = 30)	SD	1.71	1.74	1.76	1.49	4.74
Old Canadians	M	5.43	4.07	3.54	3.53	16.57
(n = 30)	SD	1.74	2.15	1.72	1.36	5.77

Therefore, on all the subtests, the Canadian participants performed significantly better than the Indian participants. In addition, the univariate F-test examining the effects of Aging Group also found significant effects on all of the four CFIT subtests: $F(1, 116) = 110.21$ $p<.001$, $\eta^2 = .247$ for Subtest 1, $F(1, 116) = 180.076$ $p<.001$, $\eta^2 = .246$ for Subtest 2, $F(1, 116) = 156.41$ $p<.001$, $\eta^2 = .329$ for Subtest 3, and $F(1, 116) = 73.63$ $p<.001$, $\eta^2 = .209$ for Subtest 4. Thus, the young participants did significantly better on all of the CFIT subtests than the old participants.

Given that significant effects were found for both age and culture on the intelligence measure, the scores for the CFIT were used as a covariate in the memory

performance analysis. Further due to the fact that all the subtests were significant, the total CFIT score were used rather than using the four separate subtest scores.

Analysis of Immediate Recall, Learning, Delayed Recall and Recognition. Scores from the Brief Visuospatial Memory Task (BVMT) were used for the memory analysis. The BVMT provided scores for immediate recall, learning, delayed recall and recognition. The means and standard deviations for all the participants are shown in Table 6.

Two separate analyses of memory performance were conducted. In the first analysis, memory performance was examined without controlling for intelligence. Following this analysis, memory performance was assessed again, however this time intelligence was used as a covariate measure. By conducting these two analyses, the differential effects of controlling for intelligence can be clearly seen.

Table 6

Mean scores and Standard Deviation Scores on the Brief Visuospatial Memory Task.

Group		Initial Recall	Learning	Delayed Recall	Delayed Recognition
Young Indians	M	6.43	4.00	10.50	11.47
(n = 30)	SD	2.47	2.02	2.11	0.78
Young Canadians	M	6.87	4.53	11.40	11.77
(n = 30)	SD	2.67	2.27	1.33	0.50
Old Indians	M	4.23	3.67	6.90	10.87
(n = 30)	SD	1.98	2.32	2.90	0.97
Old Canadians	M	5.03	3.73	8.20	11.40
(n = 30)	SD	1.79	1.93	2.77	0.97

For the first analysis, 2 x2 between subjects multivariate analysis of variance (MANOVA) was conducted. Age Group and Cultural Group were the independent variables and scores for immediate recall, learning, delayed recall and recognition from the Brief Visuospatial Memory Task (BVMT) were the dependent variables.

The multivariate F-test showed a significant main effect for Age Group (young versus old) Wilks' $\lambda = .621$, $F(4, 113) = 17.21$, $p<.001$, $\eta^2=.379$. On examination of the univariate F-tests, significant effects were found for initial recall, $F(1, 116) = 122.01$, $p<.001$, $\eta^2 = .171$, delayed recall $F(1, 116) = 346.80$, $p<.001$, $\eta^2 = .349$, and recognition $F(1, 116) = 7.01$, $p<.002$, $\eta^2 = .081$. Thus, the young participants performed significantly better than the old participant on initial recall, delayed recall and recognition. No significant differences were found between the young and old participants on the learning measure. No main effects for culture were found at the $p = .05$ level; however effects bordering on significance, Wilks' $\lambda = .929$, $F(4, 113) = 2.15$, $p<.079$, $\eta^2=.071$, were found. The univariate F-tests revealed significant effects for delayed recall, $F(1, 116) = 36.30$, $p<.012$, $\eta^2 = .053$, and recognition, $F(1, 116) = 5.21$, $p<.007$, $\eta^2 = .061$. Thus, there is some indication of cultural effects with the Canadians performing better than the Indians on the delayed recall and recognition measures.

Next, A 2 x2 between subjects multivariate analysis of variance with intelligence as a covariate (MANCOVA) was conducted. Age Group and Cultural Groups were the independent variables and scores for immediate recall, learning, delayed recall and recognition from the Brief Visuospatial Memory Task (BVMT) were the dependent

variables. The total score from the Culture Fair Intelligence Test (CFIT) was used as the measure of intelligence.

The multivariate F-test showed a significant main effect for Age Group (young versus old) Wilks' $\lambda = .847$, $F(4, 112) = 5.03$, $p<.001$, $\eta^2 = .127$. On examination of the univariate F- tests, significant effects were found for initial recall, $F(1, 115) = 33.53$ $p<.011$, $\eta^2 = .056$ and delayed recall $F(1, 115) = 57.69$ $p<.001$, $\eta^2 = .099$. Thus, the young participants performed significantly better than the old participant on initial recall and delayed recall. No significant differences were found between the young and old participants in learning or the delayed recognition task. Further, there was no significant main effect for culture, thus there were no significant differences between the Indian and Canadian participants.

Discussion

Overview

A great number of North Americans believe their memory will inevitably decline in old age (Butler & Grams, 1988; Palmore, 1988; Ryan, 1992). Research on age-related memory change has found that there is some validity to these beliefs. Generally the evidence suggests that the episodic memory system shows substantial age-related losses, whereas semantic memory and the perceptual representational system remain relatively stable well into late life. Researchers have proposed a number of underlying mechanisms to account for these age-related changes in memory. These proposed theories can be conceptualized on a continuum ranging from pessimistic views to optimistic views. Pessimistic viewpoints tend to consider cognitive deterioration that accompanies aging as being 'wired' into the nervous system (Baddley, 1986; Light & Burke, 1988). This perspective is thought to be pessimistic because it implies that memory decline is inevitable. At the optimistic end of the continuum, some researchers have argued that the expectation of memory decline produces the reality of that decline (Langer & Levy, 1994; Levy, 1996; Ryan 1992). This stance suggests that changing the expectation of decline may reduce many aspects of memory decline. Hence, many researchers holding this view have been involved in exploring the manipulation of environmental factors to improve memory functioning among older people (Holland & Rabbit, 1992; Lachman, Weaver, Bandura, Elliot & Lewkowicz, 1992).

A study from this latter perspective, conducted by Langer and Levy (1994), attempted to elucidate a psychological mechanism that contributes to memory loss by

examining aging in other cultures. Langer and Levy examined the beliefs about aging in three distinct cultures and then assessed memory performance. From this study, Langer and Levy concluded that cultural beliefs about aging play a role in determining the degree of memory loss people experience in old age. Following the lead of Langer and Levy, the goal of this study was to assess the potential impact of implicit and self-referent beliefs on memory performance. The first objective of this study was to compare self-referent and implicit memory beliefs for young and old Canadians and South Indians. Participants from India were recruited because research suggests that old age is viewed far more positively in India than in North America. The second aim of this study was to examine the relationship between beliefs and memory performance.

The following discussion has been divided into five sections. The first section examines the findings from the personal beliefs and implicit beliefs analysis. The second section reviews the results from the memory performance analysis. Next, the relationship between beliefs and memory performance is examined. Section four describes the limitations of this study and the final section outlines some of the key implications of this study.

Comparison of Beliefs about Memory

One of the main objectives of this study was to compare the self-referent and implicit beliefs about memory and aging for South Indian and Canadian participants. The hypothesis for this part of the study was that the implicit and self-referent beliefs for the Indian groups (as measured by the Personal Beliefs about Memory Instrument

and the General Beliefs about Memory Instrument) would be more positive than those of the Canadian groups.

Self-Referent Beliefs about Memory. The results from the analysis of the Personal Beliefs about Memory Instrument (PBMI) revealed that, for the most part, Indians held more positive self-referent beliefs about memory and aging than did the Canadians. Questions from the PBMI were categorized into three broad memory domains: memory efficacy, memory change and control over memory. On two of these three domains, memory efficacy and memory change, Indian participants were found to hold more positive beliefs than their Canadian counterparts. On one control construct, control over present performance, Canadian participants were found to respond more favorably than the Indian participants. Thus, although Canadians feel that they have more control over their present memory performance, they still hold less positive beliefs of memory efficacy and change. This finding suggests that for the Canadians, these more positive control beliefs may not translate into having more positive beliefs regarding memory efficacy and memory change compared to the Indians. Alternatively, even though the Indians feel that they have less control, they still feel that their memory is better. Aside from the dimension of control over present performance, all other significant findings support the premise that the Indians held more positive self-referent beliefs about memory and aging than Canadians.

Interestingly, when testing the Indian participants, some of the older participants made comments such as "no one has control" and "only the divine has control ". These comments may be reflective of the Indian culture's perspective of

personal control and personal ability to change. According to Hofstede (1980) national cultures can be classified along a dimension which he referred to as the individualism – collectivism dimension. Examples of individualist nations are USA, Britain and Canada whereas, examples of collectivist societies are Japan, China and India. According to Hofstede, people in collectivist societies typically place greater emphasis on harmony and cooperative behavior. Further, they place less importance on self versus the greater community. Individualist cultures, on the other hand, are those in which one's identity and affiliation are seen largely as a matter of personal choice. Given the lower emphasis on self in India, the concept of self-control over one's abilities may be viewed as a more novel concept in India than in Canada.

Further, broadly speaking, in the Hindu tradition, there is a strong belief of being born into a certain caste and position which may reflect a stronger view of 'nature' or genetic predisposition versus 'nurture' or environmental effects. Also, the Indian tradition holds strong views of Karma or pre-planned destiny which may also contribute towards a reduced belief in personal. This cultural perspective may account for the lack of significant findings favoring the Indians on the two control dimensions and the more favorable response of the Canadians on the one control dimension. Conversely, North Americans may believe more strongly in the ability to change and mold oneself as is reflected by popularity of self-help books.

Age differences were also found on the self-referent belief analysis. When comparing the self-referent beliefs of young and old participants, the results revealed that young participants held more favorable beliefs of memory efficacy and memory

change than did the old participants. With regard to control over memory, the young participants also held more positive beliefs of control over future memory performance. These results are consistent with other studies in the literature addressing personal beliefs about memory (Cavanaugh, 1996; Hertzog et. al., 1990; Lineweaver & Hertzog, in press).

On two of the control dimensions, the age effects varied across cultural groups. Young Indians and both young and old Canadians held more positive beliefs than did the old Indians on the control over memory dimension. In addition, on the temporal dimension of control over future performance, the old Indian group had significantly lower scores than the young Indians and both the young and old Canadians. These results indicate that the old Indian participants responses are more differentiated on the control dimension than the young Indians and the Canadians. One possible explanation for the young Indians and Canadians having more homogenous beliefs is that the young Indians have probably had more exposure earlier in their lives to western thought and beliefs than the old Indians. Given that India is moving towards greater westernization, young Indians have most likely had more exposure to the western perspective through media and schooling than the old Indians. Thus, the older Indians may hold more traditional Indian views of personal control and change whereas the younger Indians may have assimilated some of the western views in this area.

Implicit Beliefs about Memory. From the implicit beliefs analysis, one of the key findings was that all participant groups believed memory efficacy and memory control declined with age. Further all groups also believed that these declines

accelerated in later adulthood. These results are consistent with earlier work conducted on stereotypes about aging (e.g., Hummert, 1990; Kite & Johnson, 1988). In addition, research conducted on general beliefs about memory and aging also support these findings (Ryan, 1992; Ryan & Kwong See, 1993). They are also consistent with the results reported by Lineweaver and Hertzog (in press) who found that all the participants perceived the average adult as experiencing decline over the adult life span for multiple aspects of memory.

What is notable in these findings is that, like the Canadians, the Indians also viewed memory to decline with age. Although Indians hold more positive personal beliefs than Canadians, they still perceive similar decline trends as North Americans, hence, their expectation of age-related memory change is similar. For example, the Indians did not believe that memory stabilized or increased in later life. It is conceivable that more positive beliefs about memory change in later life are held in other cultures. It is also possible that Indians in rural communities may hold such views. The Indian participants in this study were recruited from an urban setting, thus they may hold less traditional Indian views. Further research in this area will be needed to investigate this issue.

In terms of cultural differences in implicit beliefs, on the whole, no significant main effects for culture were found. There were however, some significant differences in the way Indians and Canadians believed the pattern and rate of decline occurred as people age. Significant differences were found on the specific memory efficacy dimension and the control over present performance dimension. On these dimensions, it

appears that the Indians believe memory ability is still improving at age 20 and that the best performance occurs between the ages of 30 and 40 after which point decline begins to occur. This pattern indicates a later emergence of memory decline. Canadians, on the other hand, appear to believe that 20 year olds are the strongest on these dimensions and after age 20, memory begins to declines. The specific memory efficacy dimension was further moderated by an age by culture interaction. This interaction revealed that the older Indians held more positive expectations for memory efficacy than the young Indians and both young and old Canadians from midlife up into the 70s. Thus, the young Indians held more similar views to the Canadian participants about memory efficacy declining at an increasingly rapid rate in later life.

On the whole, when examining the overall trends that emerged form the implicit beliefs analysis, it appears that Indians do have more positive implicit beliefs about memory and aging for people up to middle adulthood. However, these more positive expectations do not hold for people in later adulthood. The implicit beliefs of the Canadians, on the other hand, appear to suggest that memory efficacy declines steadily after age 20. The fact that Indians hold more positive implicit beliefs for specific memory efficacy and present control may reflect the more positive beliefs about aging in the Indian society.

In addition to the cultural differences, age differences in implicit beliefs were also found. On average, older participants reported reliably higher scores than did their younger counterparts on the global memory efficacy measure. Thus, older adults held more positive beliefs about the overall memory efficacy of others than did the younger

adults. Beliefs about the pattern of memory decline on this dimension also differed between young and old participants. Compared to the older participants, young participants believed that younger adults have higher global memory efficacy. Older participants, on the other hand, held more positive global memory efficacy beliefs for middle-aged to old adults. A similar pattern was seen on the specific memory efficacy dimension. Hence it appears that young adults believe memory efficacy to be more positive for 20 and 30 year olds than do older adults. Conversely, older adults believe memory efficacy to be more positive for adults in mid- to late-adulthood. This finding is consistent with results reported by Lineweaver and Hertzog (in press). These researchers proposed that the young age group has had little personal experience with changes across the life span and therefore may have relied more heavily on negative stereotypes of aging for their ratings. The older group, on the other hand, has more experience with the effects of aging on memory and therefore higher ratings in later life could be a function of personal experiences with the aging process (e.g. in oneself, friends, acquaintances and/or family members).

On the control over future performance dimensions, the age effects varied across cultural groups. On this dimension, it seems that the older Canadians are more optimistic about controlling change in later life than the young Canadians and both the young and old Indians. Thus, it appears that the general beliefs of older Canadians are more optimistic about the ability to improve memory functioning in the future when compared to the young Canadians and the young and old Indians. Again, the control dimension appears to be one in which the Indians responses are less positive. As

discussed earlier, this may be a function of how the concept of control may be perceived in the Indian culture. Further, the fact that older Canadians perceive control over future performance more optimistically may be a function of their experiences with the aging process.

Comparison of Self-Referent and Implicit Beliefs. Although age differences in personal beliefs have been fairly well documented, less has been known about how general beliefs about memory change across the life span. Interest in the relationships between implicit theories of aging and cognition and self-referent beliefs has been growing (e.g. Cavanaugh, Feldman, & Hertzog, 1998; McDonald-Miszczak, Hertzog & Hultsch, 1995). The question of whether there is a distinction between self-referent beliefs and implicit beliefs has become an area of recent exploration. It was typically assumed that age differences in beliefs about one's own memory are closely linked to beliefs about age changes that occur in the general population (e.g., Ryan, 1993). In their recent work, Lineweaver and Hertzog (in press), argued that personal beliefs are not simply extrapolations of implicit theories about aging and memory. Although implicit theories and personal beliefs about memory efficacy and control were strongly related in their study, there was evidence to suggest that these belief systems are distinct. Exploring the distinctions between these two belief systems is possible in this study because separate measures were obtained for personal beliefs and implicit beliefs.

When comparing the results from the implicit beliefs analysis and the self-referent beliefs analysis it appears that Indians hold significantly more positive beliefs about their own memory abilities than do the Canadians. However, this pattern is not

mirrored in the implicit beliefs measure. Although on average Indians appear to believe that specific memory efficacy for others improves past early adulthood, they do not seem to think this improvement continues or is sustained into old age. Like the Canadians, the Indians seem to believe that memory declines in the later years for others. Differences in implicit beliefs and personal beliefs were also found for young and old participants. Personal beliefs about memory efficacy were higher for the younger adults than the older adults; however this pattern was reversed for the implicit efficacy beliefs. The older adults held more positive implicit beliefs about memory efficacy than the young adults.

These differences between self-referent and implicit beliefs are consistent with Camp and Pignatiello's (1988) findings in which they found that the participants held differing personal beliefs than beliefs for others in the areas of fact retrieval and inferential reasoning. In addition, these findings lend further support for Lineweaver and Hertzog's (in press) argument that although self-referent beliefs and implicit beliefs are related, personal beliefs are not merely age-appropriate manifestations of general beliefs.

Comparison of Memory Performance between Groups

The second part of this study involved comparing memory performance between groups. For this analysis, intelligence was measured because it has been found to be highly correlated with memory (Lezak, 1983). The intelligence measure employed was a non-verbal, culturally sensitive instrument. If intelligence was found to

be significantly different between groups, it would serve as a control measure for the memory performance analysis.

Comparison of Intelligence Between Groups. The results from this analysis found that intelligence did in fact differ as a function of culture and age. Canadian participants were found to perform significantly better than their Indian counterparts. In addition, the young adult participants performed significantly better than the older adult participants. Given these group differences, intelligence was used as a covariate in the memory performance analysis.

Because this measure was designed to be culturally sensitive, these results illuminate an interesting additional point. The findings highlight the point that even measures specifically designed to be culturally sensitive, may not be able to effectively eliminate cultural differences. Admittedly, this measure never purported to be culturally equivalent, simply less culturally biased. However, the Indian and Canadian participants were not significantly different in terms of age and years of education. Further, they responded similarly on number of self-reported health measures. Thus, these two groups were comparable on a number of demographic dimensions, yet, they differed significantly in their intelligence scores. It is possible that the differences in intelligence scores reflect actual differences in 'intelligence', however, it is more plausible that this instrument is not eliminating cultural bias. The differences in the scores suggests that this instrument may not be measuring the construct of intelligence on the same scale or it may not be measuring the same construct altogether. This finding yet again proves the point that researchers and practitioners must use extreme

caution when using assessment tools with populations for which no norms exist. Although the CFIT may not be culturally equivalent, it was still employed as a covariate measure because it was thought that it may control for a similar ability across cultures on the memory performance analysis.

Memory Performance Analysis. Measures of episodic memory were used for the memory performance analysis because research has found the most significant age-related memory declines in this area. Thus as was expected, significant age effects favoring the young were found in the memory performance analysis. The young participants performed significantly better than the older participants on immediate recall and delayed recall. These finding are consistent with other research that has examined memory recall of non-verbal material (Benton, 1974; Puglisi & Park, 1987; Park, Smith, Morrell, Puglisi & Dudley, 1990). No age effects were found for learning and recognition. The fact that there were no significant differences on the recognition measure is also consistent with other episodic memory research. These studies have found that when recognition tasks are used, age-related differences are less apparent (Poon, 1985; Schonfield & Robertson, 1966). Older adults typically perform more poorly than younger adults on learning tasks, however in this case, no differences were found. This finding may be a function of recruitment bias, in that the older adults who chose to participate in this study may have above average cognitive abilities. Alternatively, the symbols used in this measure may be too easy to remember over repeated trials, hence, possible ceiling effects on this learning task may not allow for differentiation between the young and old groups.

In terms of cultural differences, as was expected, there were no significant differences in memory performance between the young Indian and young Canadian participants. Thus, the young Indians and Canadians performed similarly on the measures of immediate recall, learning, delayed recall and recognition. Further, no significant differences were found for the old Indian and Canadian participants. In fact, when intelligence was not used as a covariate measure, effects bordering significance were shown to favor the Canadian participants. Thus, memory performance did not differ significantly between cultural groups.

Relationship Between Beliefs and Memory Performance.

The final objective of this study involved examining whether memory beliefs impact memory performance for the older Indian and Canadian participants. Although memory ability is most likely a combination of both beliefs and neurological and genetic ability, as a heuristic device, these two extreme perspectives have been contrasted in this study. In this study, support for more 'optimistic' views of memory and aging as proposed by such researchers as Langer and Levy (1994) and Bandura (1986, 1989 & 1992) would be offered if both memory beliefs and memory performance were significantly better for the old Indian participants when compared to the old Canadian participants. Langer and Levy (1994), for example, proposed that memory performance may be mediated or moderated by implicit beliefs about aging. Thus, from this perspective, if members of a culture held more positive implicit beliefs about memory and aging, then memory performance would also be better for these people. Another perspective proposed by Bandura (1986, 1989 & 1992) was that perceived

self-efficacy affects actual memory performance both directly and indirectly through level of cognitive effort. Thus, those who believe that their memory is good, are more likely to exercise control over their memory functioning. In addition, they are more confident in their memory capabilities and they make better use of their cognitive capacities. In relating these perspectives to this study, if the older Indians held more positive beliefs (self-referent and or implicit) and they performed significantly better on the memory performance measures than the older Canadians, then beliefs cannot be ruled out as having a positive effect on memory performance.

In contrast to these views are theories that tend to hold that age-related cognitive deterioration is 'wired' into the nervous system. From this latter perspective, Salthouse (1991) has offered a theory explaining the mechanisms underlying age-related changes in memory. Salthouse, proposed that age-related changes in memory across the adult years arise from changes in fundamental processing mechanisms such as reduced attentional capacity, reduced working-memory capacity or cognitive slowing. Hence, from this perspective, memory declines are a function of declining resources, not a function of beliefs. In this study, support for these less optimistic decline perspectives would be offered if memory performance was not significantly different between the older groups, regardless of the beliefs held. Given that no significant effects for culture were found between the Indian and Canadian participants on memory performance, the findings are consistent with the 'decline' perspective.

From Langer and Levy's perspective, it is the implicit beliefs that are thought to impact memory performance. In this case, given that the implicit beliefs were not

necessarily higher for Indians in their latest years of life, it is possible that the Indians' memory performance was actually impacted by their implicit views of decline in later life. Alternatively, the implicit beliefs held by the Indians may not have been sufficiently positive for improved memory performance. There was, after all, no significant main effect for culture on the implicit beliefs analysis. Thus, it is unclear from the results what the relationship is between implicit beliefs and memory performance. Further research examining the relationship between implicit beliefs about memory and memory performance in other nonwestern cultures would be needed in order to shed light on this question.

It should be noted that Langer and Levy (1994) found significant differences in implicit beliefs about aging and memory performance favoring older adults from China. From these findings, they concluded that more positive implicit views held by the Chinese impacted memory performance in later life. Hence, it is possible that the Chinese may hold more positive view than Indians, which is why the Chinese performed better than their North American counterparts. Alternatively, the measures used by Langer and Levy can be called into question. The tests of beliefs, for example did not measure implicit beliefs about memory. Langer and Levy's belief measures consisted of an opened-ended question which asked participants to produce five words that describe someone old and a subscale of Palmore's Facts on Aging Quiz (1988) which consisted of questions about physical capacity and aging. Thus, these questions do not ask about beliefs about memory. Further, the main memory test that was used, the 7/24 instrument (Lezak, 1983), has some similarities to a common recreational

pastime among the older Chinese people. Therefore, it is unclear from Langer and Levy's study whether the significant performance differences favoring the older Chinese participants was a function of practice effects. In addition, although the older Chinese participant held significantly more positive beliefs than the older North Americans, these beliefs were related to physical capacity and general stereotypes about aging as opposed to specifically memory beliefs. Thus, the connection between memory beliefs and memory performance is tenuous in Langer and Levy's study. Further research specifically examining the implicit beliefs about memory and memory performance in China would be needed in order to ascertain more clearly whether implicit memory beliefs impact memory performance.

As noted earlier, Bandura proposed that positive self-efficacy affects memory performance both directly and indirectly through level of cognitive effort. In this study; however, the findings do not support this view. The Indians held significantly more positive self-efficacy views about memory, however, these views did not translate into improved performance. A number of researchers have found that domain, or task specific self-efficacy measures are more highly correlated with performance than are global, omnibus measures of self-efficacy (e.g., Earley & Lituchy, 1991; Wang & Richard, 1988). Conversely, when measures of self-efficacy are broader and more generalized, the relationship between self-efficacy beliefs and performance is less evident (Dixon & Hultsch, 1983; Dixon, Hertzog & Hultsch, 1986; Hertzog, 1990). In this study the personal beliefs instrument was not asking about "task specific beliefs" (Berry et at., 1989), rather it was assessing both global or overall self-efficacy and

specific efficacy beliefs across a number of different tasks. Thus, if the measure of self-efficacy was task specific as opposed to domain specific, and if memory performance was measured on that specific task, then perhaps the older Indians would have performed better than the older Canadians.

A further notable point is that a key component of Bandura's self-efficacy model (1986) is the concept of control. According to Bandura, self-efficacy will vary as a function of whether one believes that one has the underlying competencies (e.g. effort, ability) and if one believes that events are personally determined (internal locus of control). As was noted in the findings of this study, the Indians felt they had less personal control over present performance than the Canadian however, they held higher self-efficacy beliefs. Thus, self-efficacy as a construct may be qualitatively different in the Indian culture.

A final possible explanation for the lack of memory performance differences favoring the Indians could be a function of sample selection. The Indians that were recruited were unique because they all spoke English to some degree. Thus, they may have been more 'western' in their thoughts and views than non-English speaking Indians. In addition, the Indians were recruited from an urban setting in India as opposed to rural communities, thus by virtue of residence, the participants have had greater exposure to western conditions. Additional research with non-English speaking rural Indians would be needed to investigate this issue.

Limitation of the Current Study

A number of research issues surface when cross-cultural studies are conducted. Measurement equivalence is one key area that must be considered in these types of studies. In this study, Indian participants were selected as a comparison group because it was necessary to find a culture that held significantly different beliefs than those held by Canadians. Given that these two cultures differ, it is possible that the measures used in this study may tap different concepts in these two cultural groups. Thus, the measures employed may in fact be measuring different concepts or constructs. For example, the term memory may hold different meaning in these two cultures. In addition, even if the instruments are measuring the same underlying constructs (e.g. memory) this does not mean that the metrics, or units of measurement are also equal or invariant across these populations. These issues of measurement equivalence may have come into play in the analysis of intelligence across groups. The Indians and Canadians were not significantly different on a number of demographic measures including years of education and age. However, significant differences favoring Canadians were found in the analysis. These differences could be a function of the instrument measuring different constructs or it could be that the units measuring the same construct varied across groups. Further the fact that no significant differences were found in memory performance between the two cultural groups may also be a function of lack of measurement equivalence.

A second research issue is whether the participants across cultures were equally matched. Attempts were made in this study to recruit Indians who were comparable to

the Canadians on a number of descriptive variables. The analysis of participants revealed that the Indians and Canadians were in fact not significantly different on the main demographic and health measures. Further, efforts were made to recruit English speaking Indians in order reduce any potential difficulties in language comprehension. Also, the measures were administered individually to the participants in order to ensure that the measurement instruments were correctly understood. Given all these precautions, however, it is unclear how equal the samples actually were. For example, there were no significant differences in years of education, however, it is unclear whether 10 years of education in India is the equivalent of 10 years of education in Canada. In addition, a healthy 75-year-old male with a Ph.D. in India may be more rare than a healthy 75-year-old male with a Ph.D. in Canada. Thus, nonequivalent comparison groups may impact the results.

Another sample related issue is that only men were recruited for this study. Attempts were made to recruit women in India, however, it was difficult to find older Indian women who could speak some English and who were literate. Given that Indian women could not be recruited, a decision was made to only examine the beliefs of men. Obviously, it is important to obtain the views of women and future research in this area should address this shortcoming.

A fourth potential limitation is that the sample size may have been too small to reveal significant cultural effects on the beliefs analysis and the memory performance analysis. In other words, the sensitivity of this study to detect any real effects of the independent variables may not be sufficiently powerful given the sample size. Thus,

possibly, if more participants were recruited for each group, the picture that would emerge would be different in that we may discover significant cultural effects in memory performance and/or in the implicit beliefs analysis.

As noted earlier, an episodic measure of memory was used because the episodic memory system is thought to show the most substantial age-related declines. Although the instrument used in this study measured a number of different aspects of episodic memory (i.e., recall, learning, and recognition), it might have been useful to obtain additional memory measures in order to ensure convergent validity. Thus, the lack of differences found in the memory performance analysis could be a function of the instrument used in this study. Additional measures of memory could have also shed some light on whether there may have been any measurement equivalence issues.

A final, albeit not critical, limitation of this study is that it not longitudinal. Because the participants were not followed longitudinally, it is unclear what actually happens to their memory as they age. Of particular interest is what happens to memory as Indians age because in North America longitudinal research has been conducted examining memory and aging, thus there is a body of knowledge describing what happens to memory in this population. Attempts were made so get a sense of a possible developmental changes by testing young Indians. Thus, the young Indians, like the young Canadians did significantly better than the old Indians and their Canadian counterparts. Based on these results it was presumed that memory declines with age in India even though the Indians held more positive personal beliefs systems. However,

given that the Indians were not followed over time, this point cannot be made definitively.

Conclusions and Implications

Langer and Levy (1994) presented evidence linking implicit beliefs to memory performance. According to these researchers, memory outcomes in old age may be a function of the beliefs held by society. In other words, if society believes in more positive outcomes in old age, then declines in memory performance will be reduced or eliminated. Thus, according to these researchers, the social psychological component of memory retention in old age plays a significant role in memory performance. From this perspective then, interventions would involve working towards changing implicit view about aging in North American society. Although this is no small feat, societal views can and do change over time. Therefore, memory decline in old age could become a thing of the past – simply a memory.

Alternatively, if positive beliefs do not impact performance, then there is greater support for the idea that memory ability is neurologically based. Hence, from this perspective, the brain is seen to experience similar biological declines as the human body. In this study, for the most part, the self-referent beliefs about memory were significantly more positive for the Indians. In addition, the Indians generally saw the memory of others as peaking later in life than the Canadians. However, given these more positive beliefs, memory performance of the older Indians was not significantly different than their Canadian counterparts. Thus, the results from this study support the biological explanations of memory and aging.

Throughout this study, the term 'pessimistic' has been used to describe the decline perspective because of the underlying implication that memory decline is inevitable and therefore efforts to stop the decline are for naught. So, the term pessimistic has been used to describe the lack of control over being able to stop the normative aging process. Although it may be true that intervention efforts towards ceasing decline may not be very effective, this does not mean that normative age-related declines in memory are necessarily filled with doom and gloom.

First, the normative age-related declines in memory are not as extreme as many people believe. In addition, age-related decrements are not uniform across tasks. Generally the evidence suggests that the episodic memory system shows substantial age-related losses, whereas semantic memory and the perceptual representational system remain relatively stable well into late life. Thus, only some systems of memory are impacted and the amount of impact varies considerably from person to person.

Also, a second consideration is that although losses in some memory systems may be significant, these declines may not be of practical, day to day importance well into late life. Schaie (1986) presented this argument in the area of intelligence research. He distinguished between statistically significant declines and declines that are of practical importance. Schaie argued that although significant declines may be seen earlier in the lifespan, these declines are not of practical importance well into late life. This same argument can hold in the area of memory. Memory may decline, however the declines in memory may not really impact a person's life in any significant way and therefore may not be of practical importance for most people.

Thus, in addition to trying to discover the mechanisms underlying the changes observed in memory systems, efforts should also be made to inform society about the current research in this area. Efforts to disseminate accurate information about what happens to memory as one ages may assist in changing some of the incorrectly held views currently in place. In addition, putting these age-related memory changes into a larger perspective may also reduce some of the fears that some older adults may have about memory decline.

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Appendix A

Consent Form Used for Research Participants

UNIVERSITY OF VICTORIA

Beliefs about Memory and Aging, and Memory Performance

You are invited to be a volunteer research participant in my research study which involves examining beliefs and memory performance. The purpose of this document is to describe this research project so that you may make an informed decision about whether you wish to participate.

What is the purpose of this study?
The purpose of this research is to investigate people's beliefs about memory and then test memory performance. The goal of this study is to examine the relationship between beliefs and performance.

Who is conducting this research?
This project is being conducted by Harpreet Aulakh, Graduate Student, Psychology under the supervision of Dr. David F. Hultsch of the Department of Psychology at the University of Victoria.

Exactly what will I have to do in this study?
During this study you will be asked to complete a few questionnaires, and perform a few memory and problem solving tasks. More specifically, I will ask you to:

1. Tell me about your age, education background, employment background and health status.
2. Complete two questionnaires concerning your beliefs about your memory and the memory of others.
3. Complete a few memory tasks including recalling designs and drawing designs.
4. Complete a few "mental puzzles" in which you have to figure out the rule that makes things go together.

Are these questions going to be too hard or too personal?
These tasks have been selected so that they are not too hard or too easy. I would not learn anything if everyone did perfectly or found the tasks impossible. So you can expect them to be challenging, but not too difficult. For a few questionnaires, I will be asking your opinion (e.g. whether you think you are good at remembering phone numbers). On these questionnaires, there are no right or wrong answers. It is important for you to know that you are free to refuse to participate in any specific task, or to refrain from answering any specific question.

How much time will this take?
The testing will take approximately one hour to one and a half hours.

Who finds out about what I have done? How confidential are my answers?
Everything you write or do will be held in strictest confidence. All of the papers will be identified by a code number, and your name will not appear on them. I am interested in how groups of people respond, and will not identify you as an individual.

Is there any risk in participating in this study? What are the benefits to me?
Being asked to perform a task or take a test can sometimes be a stressful experience. However, the questionnaires and tests I am using are ones that many other individuals have completed. Also, it is through the cooperation of individuals such as yourself that we are able to understand the intricacies of adult memory and how it works.

Appendix A (continued)

Will I find out about the results of the study? Can I find out how I did, personally?
If you are interested in the results of this study, when the study is completed I will send you a summary of the results. The study is not designed to provide feedback to individuals about their performance specifically. None of the tests are medical or psychiatric tests designed to diagnose individual problems. Thus, I cannot provide you with a personal assessment of your performance.

May I withdraw from the study once I have begun?
Yes. Your participation is entirely voluntary. You may decline to participate now, or you may discontinue you participation in the study at any time. Refusal or discontinuation of participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Who do I contact if I want more information or if there is a problem?
If you have questions about the study you may contact: Harpreet Aulakh, Graduate Student, Department of Psychology, University of Victoria, Victoria, BC, V8W 3P5, Telephone: (604) 472-4301 or Dr. D. F. Hultsch, Professor of Psychology, Department of Psychology, University of Victoria, BC, V8W 3P5, Telephone: 721-7525.

INFORMED CONSENT FORM

This is to certify that I,_____, hereby agree to volunteer as a participant in the research described on the back of this page and above.

The study and my part in it have been defined and fully explained to me by the investigator and I understand his/her explanation. The procedures of this study are described above and on the other side of this from and have been discussed in detail with me.

I have been given an opportunity to ask whatever questions I may have and all such questions and inquiries have been answered to my satisfaction.

I understand that I am free to refuse to participate in any specific task or to refuse to answer any specific test questions.

I understand that any data or answers to questions will remain confidential with regard to my identity.

I certify that to the best of my knowledge and belief, I have no physical illness or other problem that would increase the risk to me of participation in this study.

I further understand that I am free to withdraw my consent and terminate my participation at any time.

Date: _____Signature of Participant_____

Date: _____Signature of Investigator:_____

Appendix B

Demographic Data Sheet

Code no._____

Demographic Data Sheet

In order to better understand the results of our study, we need to know a few things about you and your background. We will use this information for research purposes only, and it will be kept strictly confidential. You will note that we do not ask for your name on the form. Please respond to the following items completely.

1. My sex is (please circle) Male Female

2. My birthdate is: _____
(Day) (Month) (Year)

3. How many years of education have you had? Please circle the highest grade or years of full-time attendance you have completed at each level.

Grade / intermediate school

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
Grade 11	Grade 12	Grade 13		

Technical, trade, nursing, or business school

1 year	2 years	3 years	4 years	5+ years

University (Bachelor's level)

1 years	2 years	3 years	4 years	5+ years

Graduate school (e.g. Master's Ph.D.)

1 years	2 years	3 years	4 years	5+ years

What is the highest degree or diploma you obtained? _____

Altogether, I would say I have had about _____ years of formal education since starting school as a child.

4. Currently, I am (please circle one):
a. married
b. single
c. widowed
d. divorced
e. separated

5. How many children do you have?_____ None _____

6. How many grandchildren do you have?_____ None_____

Appendix B (continued)

7. Currently, I am (please circle all that apply):
a. employed full-time
b. employed part-time
c. self-employed
d. retired
e. a full-time student
f. a part-time student
g. a homemaker or caregiver (in your own home)
h. doing volunteer work
i. other

8. If you are currently employed full-time or part-time or self-employed.
What is your present job?_____How long have you held your present position?_____.

9. If you are retired, what year did you retire from full-time employment?_____. What job best describes your work career prior to retirement from employment?

10. If you are a student, What program and degree are you pursuing?_____

11. If you are a homemaker or caregiver, who do you take care of?_____. If you have been employed outside the home in the past, what job best describes the work you did?

12. What is your native language?_____.

13. What is your ethnic background? _____.

14. What is your religious persuasion?_____.

15. Would your define the majority of your life-time employment as being: (please circle one)
a. Professional
b. Technical (trade specific)
c. Semi-skilled
d. Labour related
e. Other, please specify

16. Compared to a perfect state of health, I believe my overall health to be (Please circle one):
a. very good
b. good
c. fair
d. poor
e. very poor

Appendix B (continued)

17. Compared to other people my age, I believe my overall health to be: (Please circle one):
a. very good
b. good
c. fair
d. poor
e. very poor

18. Compared to other people my age, I believe my eyesight to be: (Please circle one):
a. very good
b. good
c. fair
d. poor
e. very poor

19. Compared to other people my age, I believe my hearing to be: (Please circle one):
a. very good
b. good
c. fair
d. poor
e. very poor

20. During the past four weeks did any sickness, injury, or health problem (Please circle all that apply).
a. require you to go to the hospital?
b. require you to see a doctor?
c. keep you in bed for most of the time for a day or more?
d. keep you at home but in a chair most of the time?
e. keep you at home but still able to get around?
f. let you get out but still remain a real bother?

21. About how many times have you seen a doctor in the past year? (Please circle one)
a. None
b. Once
c. 2-4 times
d. 5-12 times
e. Over 12 times

Below are a number of health problems people often have. For each one, indicate by placing a check mark in the space whether you have had this problem at some time during the past two years. If yes, also please indicate whether the problem was not too serious or fairly serious.

a. Trouble hearing (even w/hearing aid)? _No If Yes: _____Not too serious ____Fairly serious

b. Trouble seeing even with glasses?_____No If Yes: _____Not too serious ____Fairly serious

c. Arthritis, Rheumatism _____No If Yes: _____Not too serious ____Fairly serious

d. Asthma _____No If Yes: _____Not too serious ____Fairly serious

e. Bronchitis _____No If Yes: _____Not too serious ____Fairly serious

Appendix B (continued)

f. Emphysema _____No If Yes: _____Not too serious ____Fairly serious

g. Tuberculosis _____No If Yes: _____Not too serious ____Fairly serious

h. Hardening of arteries _____No If Yes: _____Not too serious ____Fairly serious

i. High blood pressure _____No If Yes: _____Not too serious ____Fairly serious

j. Heart trouble _____No If Yes: _____Not too serious ____Fairly serious

k. Stroke _____No If Yes: _____Not too serious ____Fairly serious

l. Low blood pressure _____No If Yes: _____Not too serious ____Fairly serious

m. Gall bladder or liver trouble _____No If Yes: _____Not too serious ____Fairly serious

n. Stomach ulcer _____No If Yes: _____Not too serious ____Fairly serious

o. Kidney or bladder trouble _____No If Yes: _____Not too serious ____Fairly serious

p. Paralysis not related to stroke _____No If Yes: _____Not too serious ____Fairly serious

q. Spinal condition or back trouble _____No If Yes: _____Not too serious ____Fairly serious

r. Palsy (Parkinson's Disease) _____No If Yes: _____Not too serious ____Fairly serious

s. Epilepsy _____No If Yes: _____Not too serious ____Fairly serious

t. Diabetes _____No If Yes: _____Not too serious ____Fairly serious

u. Thyroid or goiter _____No If Yes: _____Not too serious ____Fairly serious

v. Prostate problems _____No If Yes: _____Not too serious ____Fairly serious

w. Anemia _____No If Yes: _____Not too serious ____Fairly serious

x. Cancer _____No If Yes: _____Not too serious ____Fairly serious

25. Are you presently taking any drugs or medications (prescription or other)?
a. Yes
b. No

26. How old do you feel?_____

27. How old would you like to be?_____

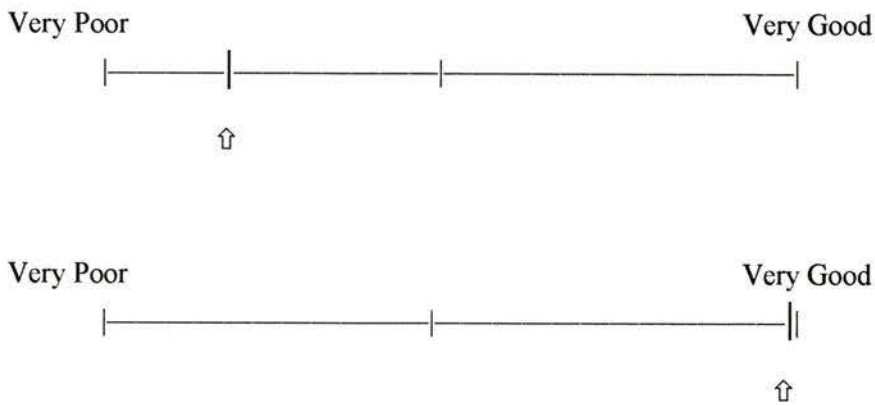
Appendix C

Personal Beliefs about Memory Instrument

Personal Beliefs about Memory Instrument

We are interested in what you think about your own memory. In this questionnaire, you will be asked to make judgements about your memory. It is important to remember that there are no right or wrong answers to these items. We want to know what you think about your memory.

Each question will be followed by a horizontal line representing a range of possible answers. Please show your answer by drawing a vertical mark across the line anywhere within the range. The midpoint of the range is marked for you. Please mark only one answer for each question. Two example ranges with correct marks are shown below. It is important to remember that you may make your mark anywhere within the range. These examples are to show you how to make a correct mark, not where place the mark.



Look at the mark on the top range. If someone made a mark here, it would indicate that they thought the answer was worse than Poor, but not quite Very Poor. Now look at the bottom range. Someone marking an answer here would show Very Good at their answer.

There will be three different kinds of items. The first kind will ask you about your ability to remember things. The second kind will ask you about changes in your memory. The third kind of item follows.

Appendix C (continued)

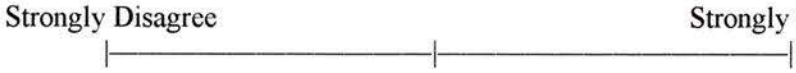
Example 1. My ability to remember where I park my car is: (note: if you do not drive then substitute where my keys are:)

If you think that you are very poor at remembering where you park your car, you would make a mark on the line labelled "Very Good." If your ability to remember where you park your car lies somewhere between these two, you would mark your answer at the place along the line which best matches your judgement.

Example 2. In the last five years, my ability to remember where I park my car has beome: (note: if you do not drive then substitute where my keys are:)

If you think that your ability ato remember where you park your car has become much worse in the last five years, you would make a mark on the line labelled "Much Worse." If you think your ability to remember where you park your car has become much better in the last five years, you would make a mark on the line labelled "Much Better." Once again, you may make a mark anywhere along the range to indicate where your answer falls.

Example 3. If I need to remember where I park my car, there are things I can do to make remembering more likely. (note: if you do not have a car substitue keys.)



If you strongly disagree with this statement, you would make a mark on the line labelled "Strongly Disagree." If you strongly agree with this statement, you would make a mark on the line labelled "Strongly Agree." If your judgement is somewhere between these two, you would make a mark along the range to show how strongly you agree or disagree with this statement.

The items will be grouped into sections. Each section will be preceded by a brief explanation of the types of questions included. Please read the instructions for each section carefully before beginning to answer the items which follow, so that you can be certain you understand the kind of ratings you are being asked to make.

Appendix C (continued)

Global Memory Ability.

We would like to know how good you think you memory is. This question is asking about your ability to remember in general. Please read the item carefully and mark your answer on a range from "Very Poor" to "Very Good."

1. My ability to remember in general is:

Very Poor — Very Good

Relative Standing.

We would like to know how good you think your memory is compared to other adults. Though some adults have health problems which interfere with their memory, we want to know about relatively healthy adults. Thus, when you are answering these questions, please try to think of groups of adults who are relatively healthy for their age. We will ask you to compare yourself to two different groups. The first group will include adults your age. The second group will include adults of all ages. Please read each item carefully and mark your answers on a range from "Much Below Average" to "Much Above Average."

2. Compared to all adults my age, my memory is:

Much Below Average — Much Above Average

3. Compared to all adults of all ages, my memory is:

Much Below Average — Much Above Average

Appendix C (continued)

Retrospective Change.

We would like to know how you think your memory has changed through the years. This section will include two sets of questions. The first set will ask you to compare your memory now to your memory ten years ago. The second set will ask you to compare your memory now to your memory when you were eighteen years old. Even though you may not remember exactly what your memory was like in the past, please try to answer watch question as best as you can. Please read each item carefully and rate changes in your memory by making a mark within the ranges provided. Please note that the range differs depending on the item. In order to understand what the question is asking, you must read the labels at both ends of the range before you answer.

4. Compared to 10 years ago, my ability to remember things now is:

Much Worse — Much Better

5. Over the last 10 years, remembering things has become:

Much Harder — Much Easier

6. Compared to 10 years ago, my memory now is:

Much Less Efficient — Much Less Efficient

7. Over the last 10 years, my memory has:

Greatly Declined — Greatly Improved

8. Compared to when I was 18, my ability to remember things now is:

Much Worse — Much Better

9. Since I was 18 years old, remembering things has become:

Much Harder — Much Easier

10. Compared to when I was 18, my memory now is:

Much Less Efficient — Much Less Efficient

Appendix C (continued)

11. Since I was 18 years old, my memory has:

Greatly Decline ——— Greatly Improve

Prospective Change.

We would like to know how you think your memory will change in the future. This section will include two sets of questions. The first set will ask you to compare your memory now to your memory now to your memory when you are seventy-five years old. Please read each item carefully and mark your answers on the ranges provided. Please note that the range differs depending on the item. In order to understand what the question is asking, you must read the labels at both ends of the range before you answer. If you are older than seventy-five years old, you may skip items 40 through 43 on the next page.

12. Compared to my present ability, 10 years, 10 years from now my ability to remember things will be:

Much Worse ——— Much Better

13. In the next 10 years, remembering things will become:

Much Harder ——— Much Easier

14. Ten years from now, my memory will be:

Much Less Efficient ——— Much Less Efficient

15. Between now and 10 years from now, my memory will:

Greatly Decline ——— Greatly Improve

16. Compared to my present ability, when I am 75 years old, my ability to remember things will be:

Much Worse ——— Much Better

Appendix C (continued)

17. Between now and when I am 75 years old, remembering things will become:

Much Harder ——— Much Easier

18. When I am 75 years old, my memory will be:

Much Less Efficient ——— Much Less Efficient

19. Between now and when I am 75 years old, my memory will:

Greatly Decline ——— Greatly Improve

Control Over Memory.

We would like to know how much control you think you have over your memory. Control is defined as anything you can do to influence how your memory works. We want to know how much control you think you can have over your memory, not how much of this control you actually use. This section will include three sets of questions. The first set will ask you about how things you do now can affect the way your memory currently functions. The second set will ask you about how things you do now can affect how your memory will function in the future. The third set will ask you about how things you do in the future can affect your future memory functioning. Please read each item carefully and mark your answers on the ranges provided. Please note that the range differs depending on the item. In order to understand what the question is asking, you must read the labels at both ends of the range before you answer.

20. There are things I can do to help me remember.

Strongly Disagree ——— Strongly Agree

21. I can improve my chances of remembering something if I work at it.

Strongly Disagree ——— Strongly Agree

22. If I want to remember something, things I do make remembering more likely.

Strongly Disagree ——— Strongly Agree

Appendix C (continued)

23. The amount of control I have over my memory is:

None A Lot

24. I can do things now to determine what my memory will be like in the future.

Strongly Disagree Strongly Agree

25. I can control the amount my memory will change in the future.

Strongly Disagree Strongly Agree

26. Exercising my memory now will affect my memory functioning in the long run.

Strongly Disagree Strongly Agree

27. Proper diet and physical exercise now will affect my memory functioning in the long run.

Strongly Disagree Strongly Agree

28. My memory functioning in the future depends on what I do now.

Strongly Disagree Strongly Agree

29. In the future, the amount of control I will have over my memory will be:

None A Lot

30. Compared to the amount of control I now have over my memory, the amount of control I will have over my memory in the future will be:

Much Less Much More

31. In the future, things I do will affect how well I will remember something.

Strongly Disagree Strongly Agree

Appendix C (continued)

32. Later in life, I will be able to improve my chances of remembering something by working at it.

Strongly Disagree — Strongly Agree

33. In the future, if I want to remember something, things I do will make remembering more likely.

Strongly Disagree — Strongly Agree

Specific Memory Ability.

We would like to know how good you think you are at specific kinds of remembering. Please read each item carefully and mark your answers on a range from "Very Poor" to "Very Good."

34. My ability to remember where I place an everyday object is:

Very Poor — Very Good

35. My ability to remember people I have met in the past is:

Very Poor — Very Good

36. My ability to remember names is:

Very Poor — Very Good

37. My ability to remember faces is:

Very Poor — Very Good

38. My ability to remember my appointments is:

Very Poor — Very Good

39. My ability to remember trivia is:

Very Poor — Very Good

Appendix C (continued)

40. My ability to remember events I personally experience is:

Very Poor Very Good

41. My ability to remember to do something at a later time is:

Very Poor Very Good

42. My ability to remember a telephone number I just checked is:

Very Poor Very Good

43. My ability to remember a telephone number I recently use is:

Very Poor Very Good

44. My ability to remember how to get somewhere I go frequently is:

Very Poor Very Good

45. My ability to remember how to get somewhere after getting directions is:

Very Poor Very Good

46. My ability to remember my daily schedule is:

Very Poor Very Good

47. My ability to remember whether I already told someone something is:

Very Poor Very Good

48. My ability to remember short grocery lists is:

Very Poor Very Good

Appendix C (continued)

49. My ability to remember the meanings of words is:

Very Poor ——————————————— Very Good

50. My ability to remember words I need when conversing with someone is:

Very Poor ——————————————— Very Good

51. My ability to remember places I visit is:

Very Poor ——————————————— Very Good

52. My ability to remember the order in which events occur is:

Very Poor ——————————————— Very Good

53. My ability to remember conversations I have held is:

Very Poor ——————————————— Very Good

54. My ability to remember the source of information is:

Very Poor ——————————————— Very Good

55. My ability to remember things I am sure I know is:

Very Poor ——————————————— Very Good

56. My ability to remember things that happened long ago is:

Very Poor ——————————————— Very Good

57. My ability to remember things that happened recently is:

Very Poor ——————————————— Very Good

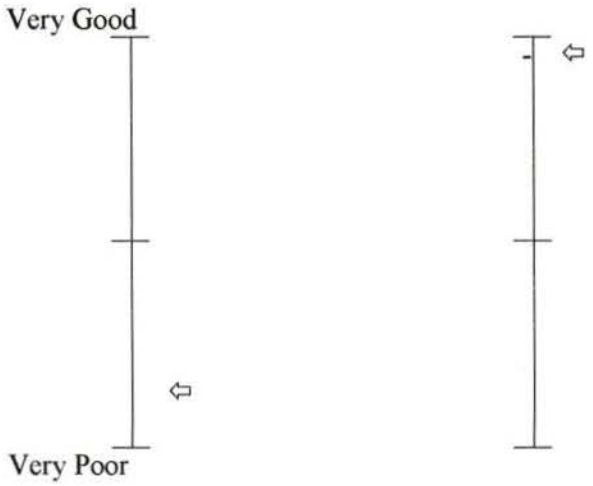
Appendix D

Code No.:_____

General Beliefs about Memory Instrument

We are interested in what you think about memory in other adults. In this questionnaire, you will be asked to make judgements about the memory of average adults. Though some adults have health problems which interfere with their memory, we want to know about memory in relatively healthy adults. Thus, when you are answering these questions, please try to think of an average adult who is relatively healthy for his or her age. It is important to remember that there are no right or wrong responses to these items. We just want to know what you think about memory in the general population of adults.

Each question will be followed by a set of eight vertical lines, each representing a range of possible answers. We are interested in average adults of age 20, 30, 40, 50, 60, 70, 80 and 90. Each of the eight lines will have one of these ages written below it. You will answer each question eight times, once for each age. Please show your answers by drawing a horizontal mark across each line anywhere within the range. The midpoint of the range is marked for you. Please mark only one answer on each line. Two example ranges with correct marks are shown below. It is important to remember that you may make your mark anywhere within the range. These examples are to show you how to make a correct mark, not where to place the mark.

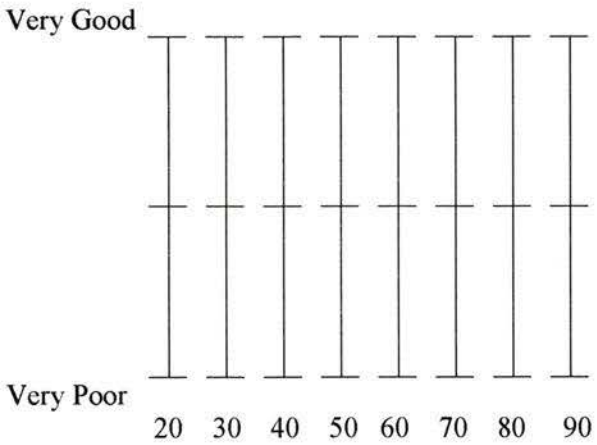


Look at the mark on the range to the left. If someone made a mark here, it would indicate that they thought the answer was worse than Poor, but not quite Very Poor. Now look at the range on the right. Someone marking an answer here would show Very Good as their answer.

There will be two different kinds of items. The first kind will ask you about the ability of average adults to remember things. The second kind will ask you about how average adults can affect their memory by the things that they do. Though we realize that every individual is different, these questions will ask you to think about an average adult of each of the eight ages who is relatively healthy. Even if you find a question difficult to answer, please try your best to complete every item. An example of each kind of item follows.

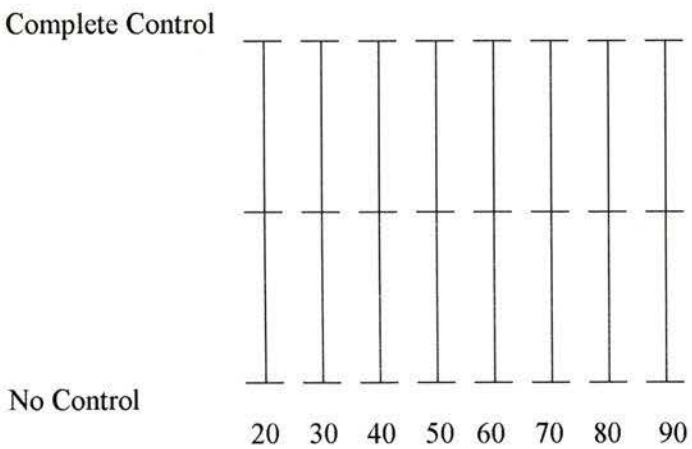
Appendix D (continued)

Example 1. My ability to remember where the car has been parked:



If you think that an average 20 year-old is very poor at remembering where the car has been parked, you would make a mark on the line labeled "Very Poor" for the range with the 20 under it. If you think that an average 20 year-old is very at remembering where the car has been parked, you would make a mark on the line labeled "Very Good" for the range with the 20 under it. If you think the ability of an average 20 year-old for this kind of memory lies somewhere between these two, you would mark your answer at the place along the line which best matches your judgement. You would then continue to respond for an average 30 year-old, 40 year-old, 50 year-old, etc., marking your answers along the ranges with the 30, 40, 50, etc. under them.

Example 2. Amount of control over remembering where the care has been parked.



Control is defined as anything the adult can do to influence how his or her memory works. In this instance, how much influence does an average adult have over whether he or she will remember where the car has been parked? If you think that an average 20 year-old cannot do anything which will determine whether this information will be remembered, you would make a mark on the line labeled "No Control."

Appendix D (continued)

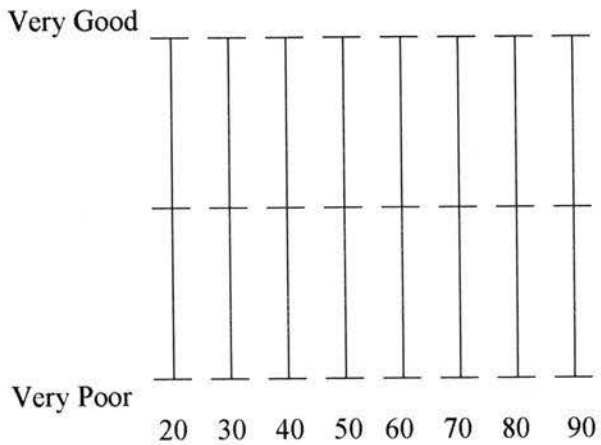
If you think that an average 20 year-old can do things which will completely control whether this information will be remembered, you would make a mark on the line labeled "Complete Control." If your judgement lies somewhere between these two, you would mark your answer at the place along the line which best matches your judgement. You would then continue to respond for an average 30 year-old, 40 year-old, etc., marking your response along the ranges with the 30, 40, 50, etc. under them.

The items will be grouped into sections. Each section will be preceded by a brief explanation of the types of questions included. Please read the instructions for each section carefully before beginning to answer the items which follow, so that you can certain you understand the kind of ratings you are being asked to make.

Global Memory Ability.

We would like to know how good you think the memory of average adults is. This question is asking about the ability of each adult to remember in general. Please read the item carefully and mark your answers on a range from "Very Good" to "Very Poor."

1. Ability to Remember in General



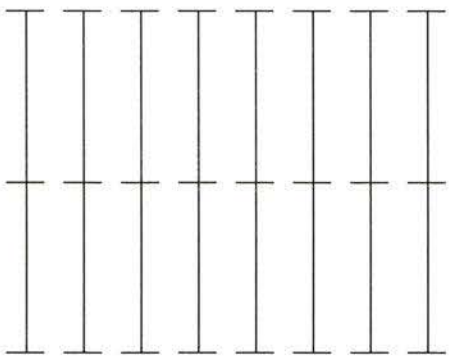
Appendix D (continued)

Control over Memory.

We would like to know how much control you think average adults have over their memory. Control is defined as anything they can do to influence how their memory works. Therefore, they can be said to have control to the extent that they have the ability to affect how well things are remembered. We are interested in how much control the adults can have over their memory, not how much of this control they actually use. Please read each item carefully and mark your answers on a range from "Complete Control" to "No Control."

2. Amount of control over present memory functioning. The extent to which the adult can do things now that will determine how his or her memory works.

Complete Control

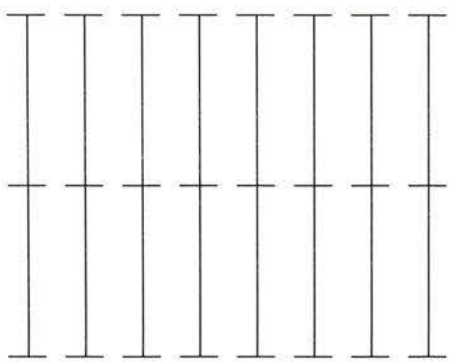


No Control

20 30 40 50 60 70 80 90

3. Amount of control over future memory functioning. The extent to which the adult can do things now that will determine how his or her memory will work in the future.

Complete Control



No Control

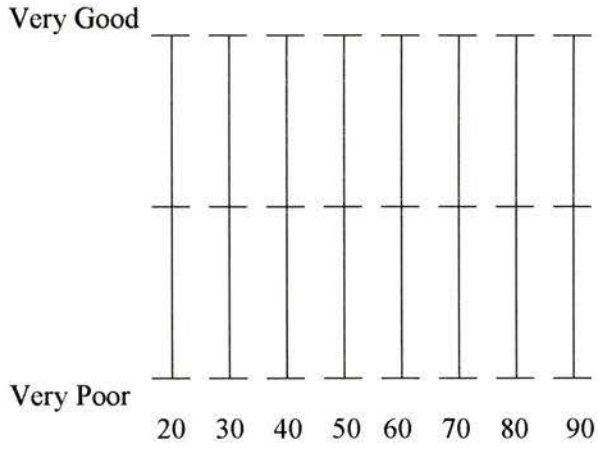
20 30 40 50 60 70 80 90

Appendix D (continued)

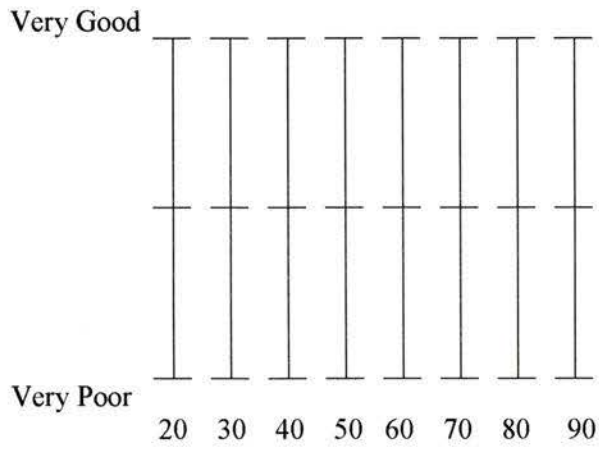
Specific Memory Ability.

We want to know how good you think average adults are at specific kinds of remembering. Please reach each item carefully and mark your answers on a range from "Very Good" to "Very Poor."

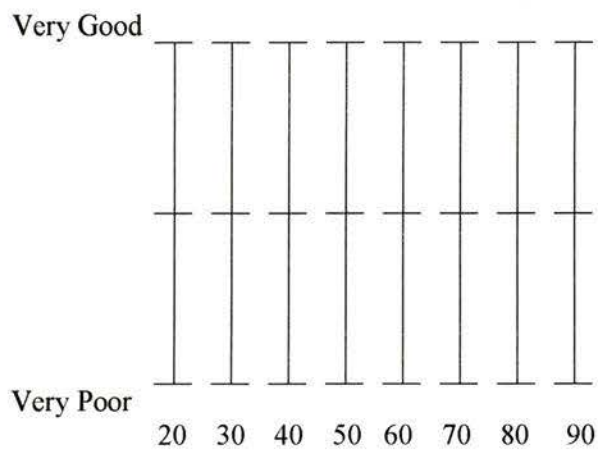
4. Ability to Remember Where An Everyday Object Has Been Placed



5. Ability to Remember People Met in the Past

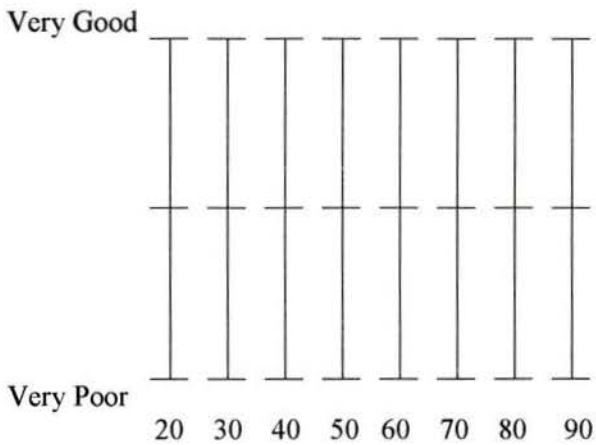


6. Ability to Remember Names

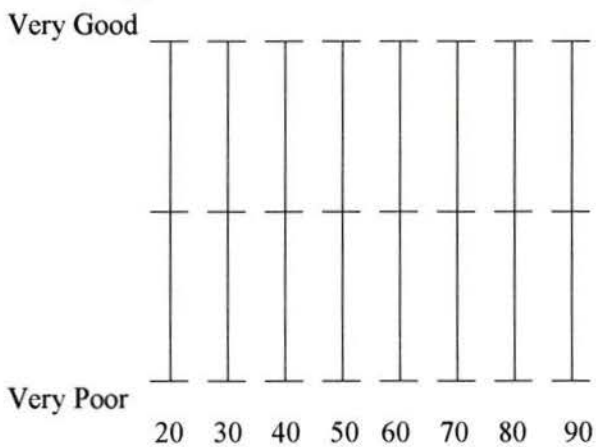


Appendix D (continued)

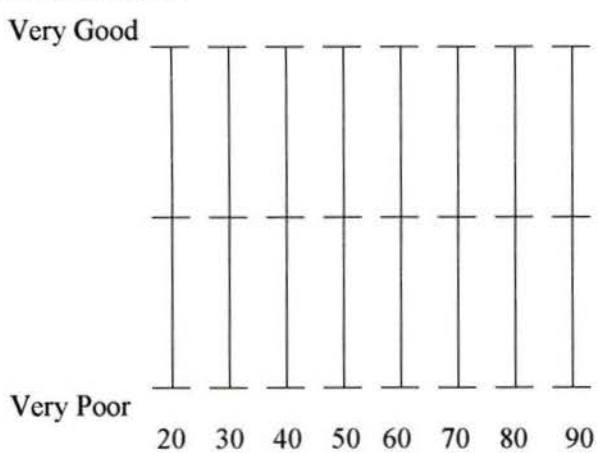
7. Ability to Remember Faces



8. Ability to Remember Appointments

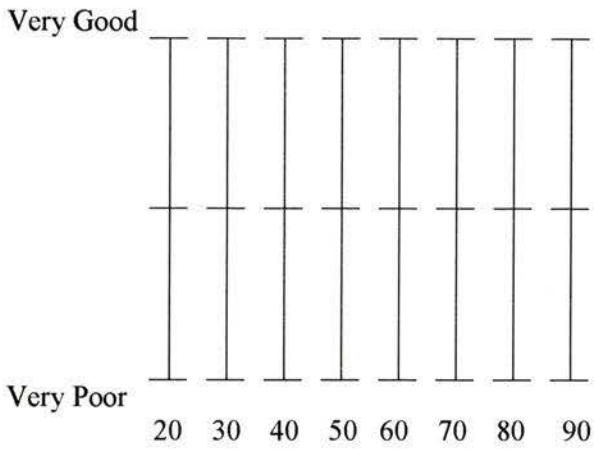


9. Ability to Remember Trivia

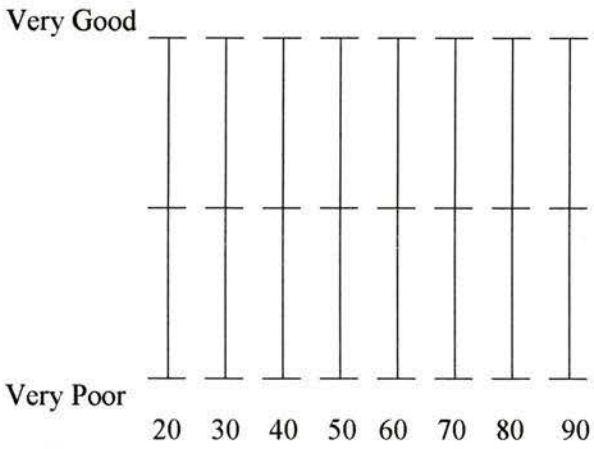


Appendix D (continued)

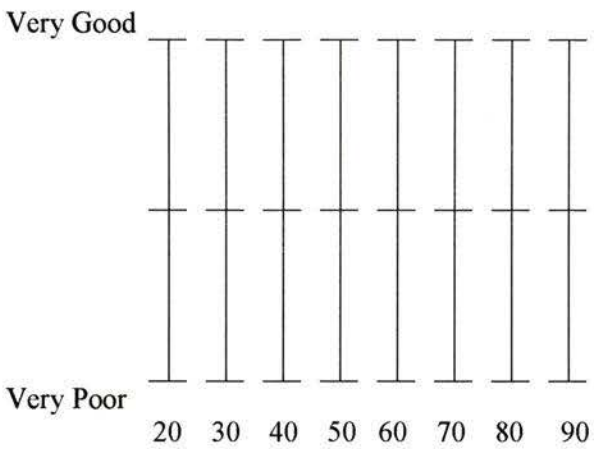
10. Ability to Remember Personally Experienced Events



11. Ability to Remember To Do Something At a Later Time

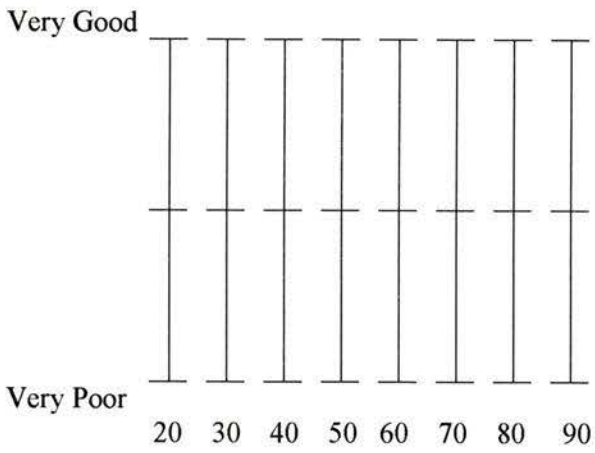


12. Ability to Remember A Telephone Number Just Checked

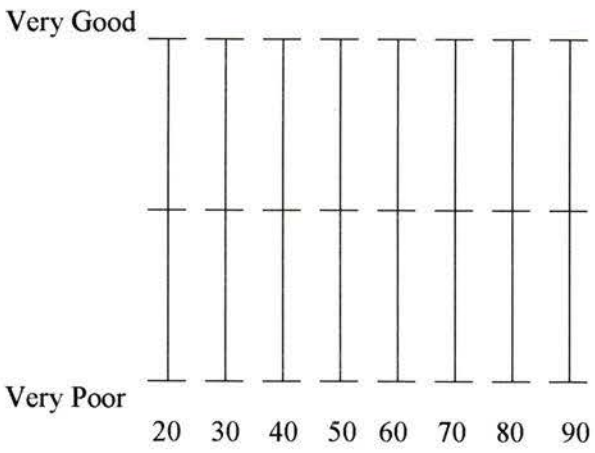


Appendix D (continued)

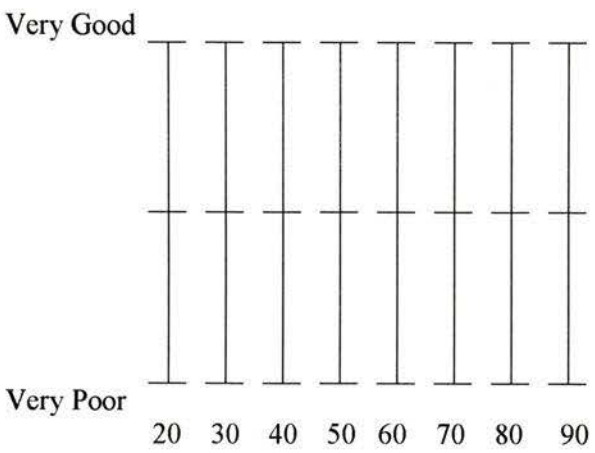
13. Ability to Remember A Frequently Used Telephone Number



14. Ability to Remember How To Get Somewhere Frequently Traveled

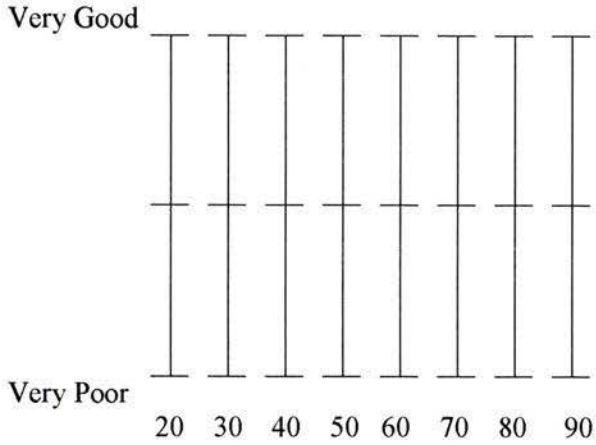


15. Ability to Remember How to Get Somewhere After Getting Directions

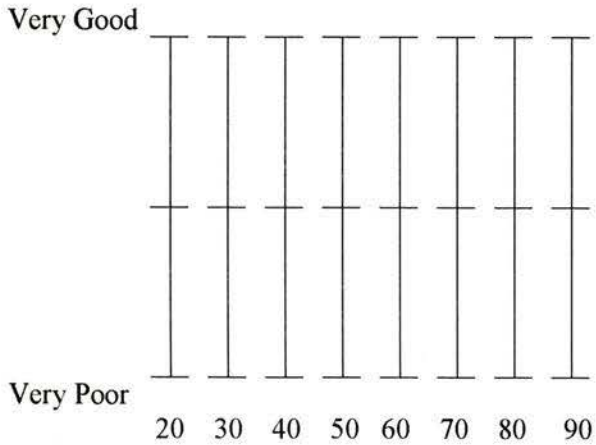


Appendix D (continued)

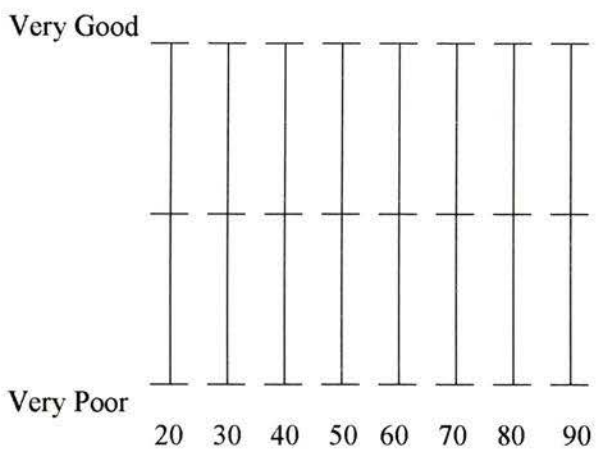
16. Ability to Remember A daily Schedule



17. Ability to Remember Whether Something Has Already Been Told To Someone

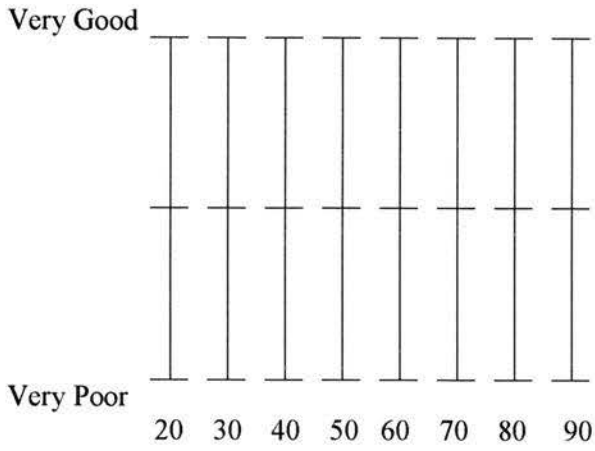


18. Ability to Remember Short Grocery Lists

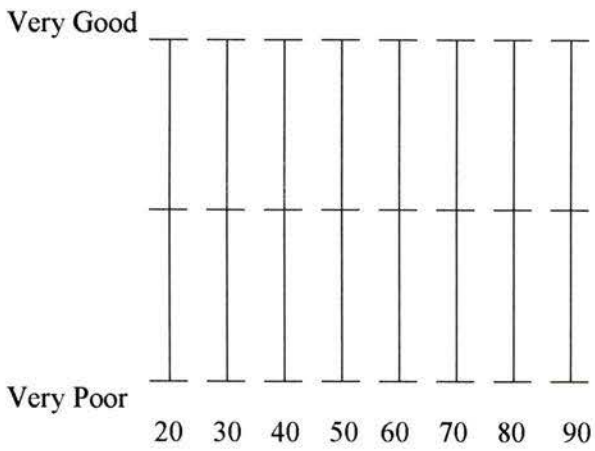


Appendix D (continued)

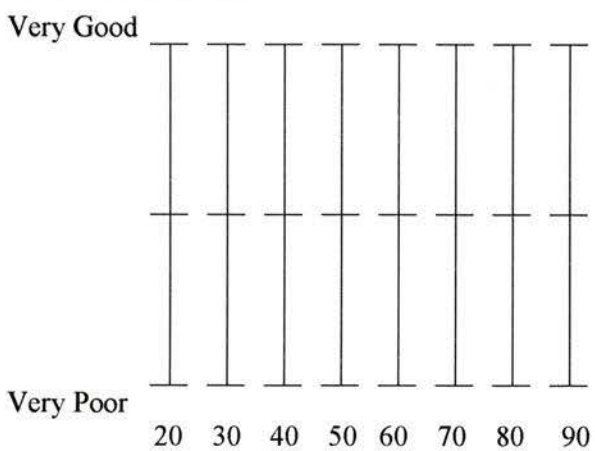
19. Ability to Remember the Meaning of Words



20. Ability to Remember Words Needed When Conversing with Someone

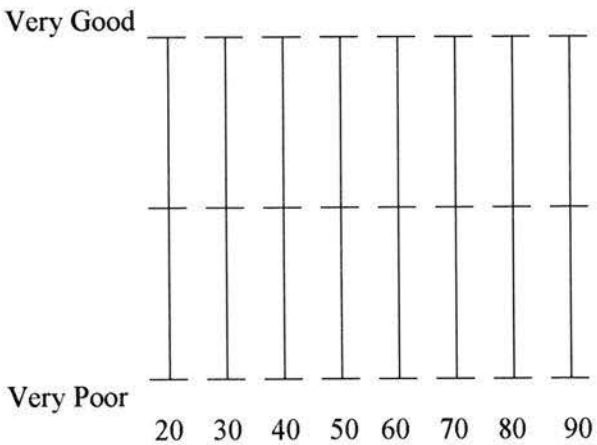


21. Ability to Remember Places Visited

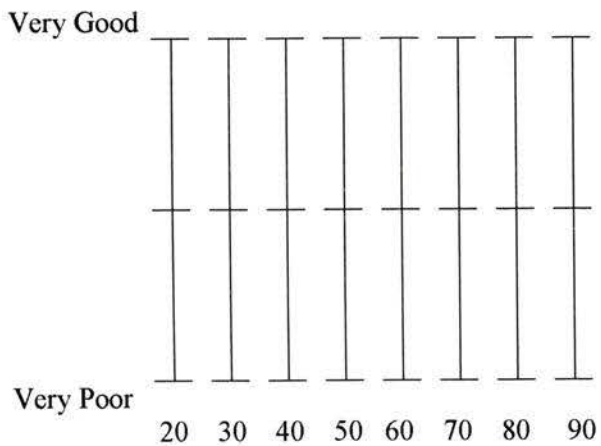


Appendix D (continued)

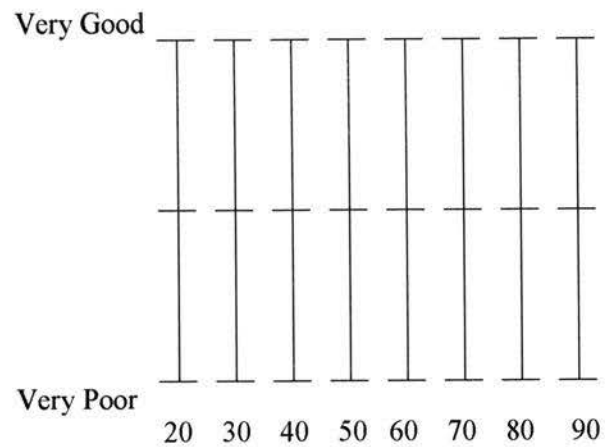
22. Ability to Remember the Order In Which Events Occur



23. Ability to Remember Conversations Held

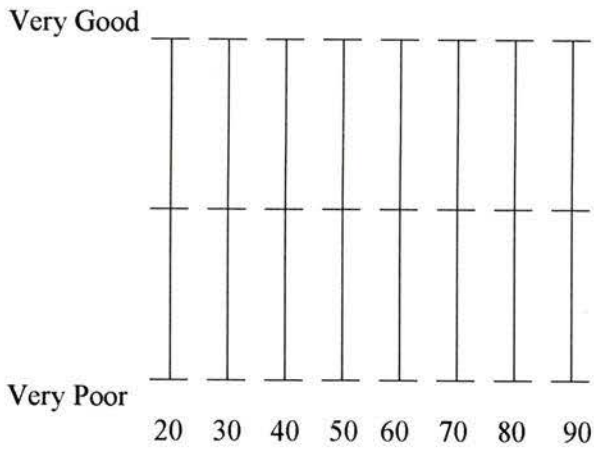


24. Ability to Remember the Source of Information

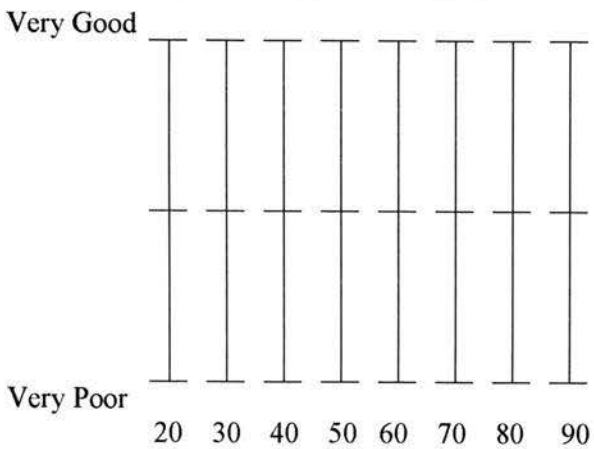


Appendix D (continued)

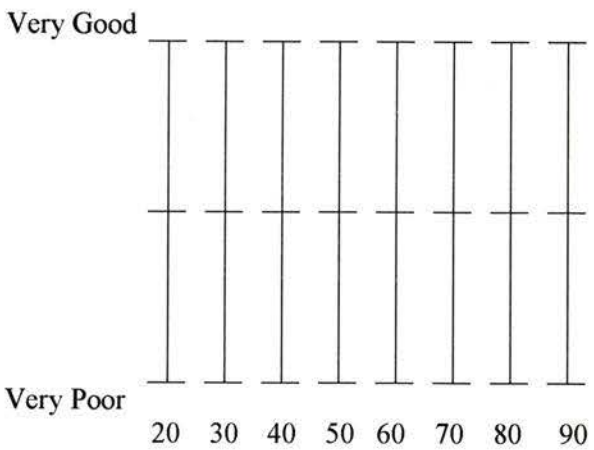
25. Ability to Remember Things the Adult is Sure They Know



26. Ability to Remember Things that Happened Long Ago



27. Ability to Remember Things that Happened Recently



Appendix E

Brief Visuospatial Memory Test

Response Form

Ralph H. B. Benedict, PhD

B V M T R

Brief Visuospatial Memory Test-Revised

Name _____ Test Date ____/____/____
ID# _____ Birthdate____/____/____
Gender_____ Ethnicity_____ Handedness_____
Education _____ Age_____ Examiner_____

Form Administered: 1 2 3 4 5 6 (circle one)

	Raw score	*T* score	Percentile
Trial 1			
Trial 2			
Trial 3			
Total Recall[1]			
Learning[2]			
Delayed Recall			
Percent Retained[3]			
Recognition Hits			
Recognition False Alarms			
Recognition Discrimination Index[4]			
Recognition Response Bias			
Copy (optional)			

Normative table/comparison group _____

[1]Total Recall = (Trail 1 raw score + Trial 2 raw score + Trial 3 raw score).
[2]Learning = (Higher value of Trial 2 raw score or Trial 3 raw score) – Trial 1 raw score.
[3]Percent Retained = [Delayed Recall raw score ÷ (higher value of Trial 2 raw score or Trial 3 raw score)] x 100.
[4]Recognition Discrimination Index = Recognition Hits raw score – Recognition False Alarms raw score.

Delay Interval Table

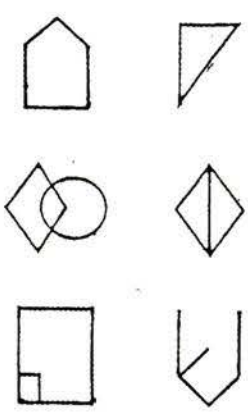
Time Trial 3 completed	
Time Delayed Recall started	
Delay interval (minutes)	

Appendix E (continued)

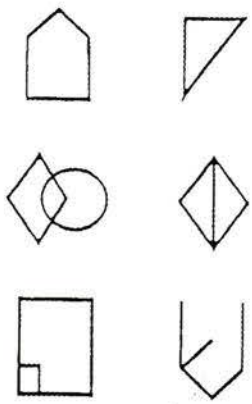
Brief Visuospatial Memory Test – Revised

FORM 1

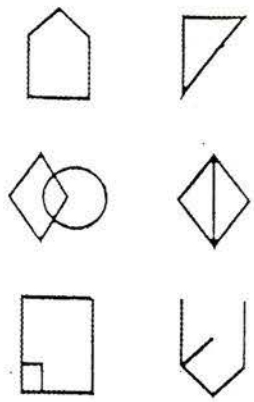
NAME_____ AGE ___ TEST DATE _____ TESTER_____



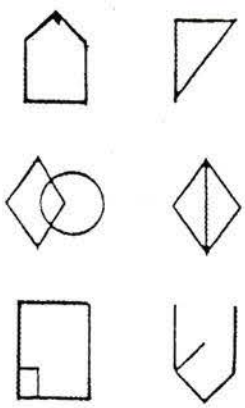
Trial 1 Recall ____



Trial 2 Recall ____



Trial 3 Recall ____



Delayed Recall ____

Card 1	YES	no
Card 2	yes	No
Card 3	YES	no
Card 4	yes	NO
Card 5	yes	NO
Card 6	YES	no
Card 7	YES	no
Card 8	yes	NO
Card 9	YES	no
Card 10	yes	NO
Card 11	yes	NO
Card 12	YES	no

Delayed Recognition:
Hits ____/6
False Alarms ____/6

Appendix F

Culture Fair Intelligence Test

IPAT

Code No._____

Test of g: Culture Fair

Scale 3, Form B

Prepared by R. B. Cattell and A. K. S. Cattell

Name_____

Name of School_____

Today's Date_____ Grade (or Class)_____

Date of Birth_____ Age_____

Test	Score	Remarks
1		
2		
3		
4		
	Total Score:	

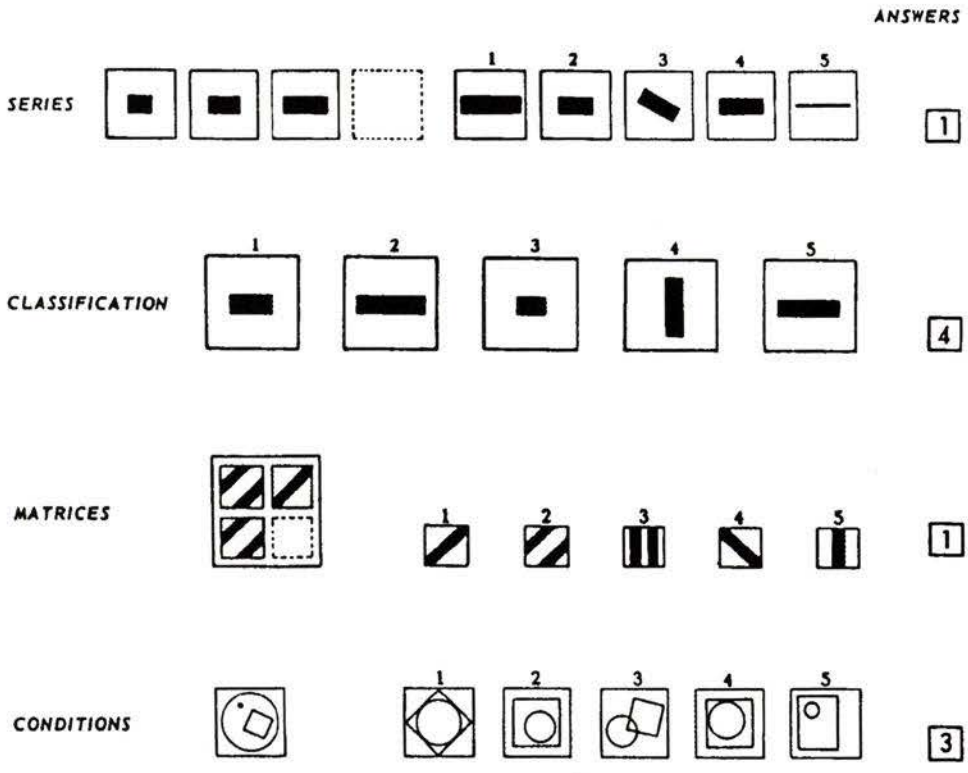
I.Q._____

Do not turn the page until told to do so.

1961 Edition
(Second)

Appendix F (continued)

SAMPLE ITEMS USED IN CULTURE FAIR INTELLIGENCE TESTING



Appendix G

Debriefing Form Given to all Research Participants

UNIVERSITY OF VICTORIA

Explanation of Beliefs about Aging and Memory Performance Study:

Dear participant,

I want begin by thanking you for taking the time to participate in this study.

The objective of this study is two-fold. My first goal is to examine whether implicit beliefs (normative or social beliefs) about aging and memory differ significantly in two different cultural groups. In order to measure differing beliefs about memory and aging, I am selecting participants from cultures that hold distinctively different views about aging and memory. From my review of the literature, two cultures that appear to hold very different beliefs about memory and aging are the South Indian culture and the North American culture. The Indian culture appears to hold its elderly in high and positive regard whereas in North America, the elderly are viewed much more negatively. Thus, I will be conducting a cross-cultural comparison between Indians in India and North Americans.

Within each cultural group I am be testing a 'young' group and an 'older' group of participants. Therefore, this study will consist of four groups: a young and older Indian group; and a young and older North American group. All four groups are being tested for their beliefs about memory and aging. My hypothesis for this component of the study is that the Indian participants (both young and old) will hold more positive beliefs about memory and aging than North American participants (both young and old).

My second objective is to then examine whether these beliefs impact memory performance. Both the Indian and the North American participants are being given memory performance tests. My first hypothesis is that the performance of the young groups (Indian and North American) will not be significantly different on the memory tasks. My second hypothesis is that if the older Indian group performs better on the memory tasks than the North American group, then this may be due to the more positive implicit beliefs held by Indians.

If you have any further comments or questions please contact: Harpreet Aulakh, Department of Psychology, University of Victoria, Victoria, BC, V8W 3P5, telephone: (604) 472-4301 or Dr. D. F. Hultsch, Professor of Psychology, Department of Psychology, University of Victoria, Victoria, BC V8W 3P5, telephone: 721-7488.

Thank you again,

Harpreet Aulakh

VITA

Surname: Aulakh Given Names: Harpreet Aulakh

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Education Institutions Attended:

University of Victoria	1996 to 1999
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University of British Columbia	1984 to 1989

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Bachelors of Arts	University of British Columbia	1996

Publications and Presentations:

Aulakh, H. K., Hultsch, D. F. (1997, October). An examination of well-being in a longitudinal sample. Poster session presented at the annual meeting of the Canadian Association of Gerontology, Vancouver, BC.

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Title of Thesis:

Cross-Cultural Comparison of Implicit Beliefs and Self-Referent Beliefs about Aging and Memory Performance

Author 

Harpreet Kaur Aulakh

April 28th, 1999