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# The effects of memory knowledge on attributions of forgetfulness in younger and older adults

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**THE EFFECTS OF MEMORY KNOWLEDGE  
ON ATTRIBUTIONS OF FORGETFULNESS IN YOUNGER AND OLDER ADULTS**

A Dissertation

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

in

The Department of Psychology

by

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## ABSTRACT

This study examined the relationship between memory knowledge and peoples' perceptions of forgetful younger and older adults in two ways. First, using an experimental approach, younger and older research participants were assigned to one of three information conditions: control (received no information about memory and aging), grandparent (received information about grandparent-grandchild relationships), and memory aging (received information about normative age-related changes in memory functioning in later adulthood). One week later, participants read six vignettes describing fictitious persons experiencing everyday instances of forgetting who were either younger (23-35 years of age) or older (63-75 years of age). Following Erber, Szuchman, and Rothberg (1990a), participants rated the likelihood of six possible causes for the memory failures: ability, effort, task difficulty, luck, and two scales measuring attention (external and internal distractions). Participants also rated the degree to which: (a) the forgetting was a sign of mental difficulty, (b) the person should seek training to improve his/her memory, and (c) the person should seek medical and/or psychological evaluation for the forgetting. Participants made their evaluations on separate 7-point Likert scales. Contrary to expectations, the groups did not differ in perceptions of older forgetful persons; however, participants in the memory aging seminar group showed significant pre- to posttest gains on the Knowledge of Memory Aging Question (KMAQ; Cherry, West, Reese, Santa Maria, & Yassuda, 2000), indicating that the information presented increased knowledge of normal age-related memory changes. Second, individual differences in memory aging knowledge were analyzed by evaluating the relationship between pretest performance on the KMAQ and ratings on the causal attribution and memory opinion scales for participants in the two control conditions only (control and grandparent seminar participants). Contrary to expectations, but confirming findings from the experimental

approach, pretest knowledge of normal age-related memory changes were not correlated with evaluations of forgetful individuals. Taken together these data suggest that perceptions of forgetfulness in older adults are not necessarily influenced by explicit knowledge of normative age-associated memory changes.

## INTRODUCTION

Negative stereotypes based on age are pervasive in our culture. We see negative images of aging portrayed in everything from humorous birthday cards to television programs (Vasil & Wass, 1993). Sternberg (1987) argues that stereotypes and attitudes toward others are influenced by implicit theories, or informal notions about how the world works. This is a social cognitive view of stereotypes in which stereotypes are viewed as schemas people use to make sense of the vast amount of information contained in social contexts. From this perspective, stereotypes are not inherently negative. Hummert (1999) has shown that age is one category upon which schemas are based, activating both positive and negative stereotypes. For example, Hummert (1990) documented negative stereotypes of the elderly, such as the “invalid” -- characterized as *forgetful, slow thinking, fragile, and should be in a nursing home* -- as well as positive stereotypes, such as the “perfect grandparent” -- characterized as someone who *enjoys life, is generous, happy, and likes to be around young people*. The perfect grandparent stereotype also includes cognitive characteristics such as *capable, intelligent, and wise*. Although age stereotypes are not intrinsically negative, studies have found that negative perceptions based on age are activated more easily than positive aging stereotypes (e.g., Perdue & Gurtman, 1990). And, Lineweaver and Hertzog (1998) found that advancing age is associated with a general expectation of declining memory ability.

It is important to note that cognitive impairment is not as ubiquitous as common stereotypes and implicit theories of aging would lead us to believe. That is, cognitive aging shows much intra-individual variability as well as inter-individual plasticity (Baltes, Dittmann-Kohli, & Dixon, 1984). In general, cognitive aging research has found age declines to be relatively small, with healthy older adults functioning within ranges considered normal for

younger adults (Salthouse, 1991). Probably the most prominent change with age is the gradual decline in reaction time, which, in turn, may affect other areas of cognitive functioning (Salthouse, 1991). For example, tasks on traditional intelligence tests that focus on speed of processing (e.g., the digit-symbol substitution task) show greater declines with age compared to tasks that focus on knowledge that is acquired through experience (e.g., vocabulary). Additionally, laboratory studies examining cognitive functioning in older adults show that declines can be minimized when supportive task materials are used (for a review see Craik & Jennings, 1992, and Smith & Earles, 1996). Overall, memory changes found in healthy older adults are neither catastrophic nor disabling, with the majority of older adults demonstrating intact cognitive abilities (Dixon & Cohen, 2003).

Cognitive aging researchers note important distinctions between the processes of normative cognitive aging, which is present in varying degrees in most people over the age of 65, and pathological memory aging, which is primarily associated with vascular and cerebral degenerative illnesses (e.g., heart disease and Alzheimer's disease; Cherry & Smith, 1998). Pathological memory deficits are associated with widespread damage to the brain that can lead to profound changes in behavior (for a review see Cherry & Plauche, 1996). For example, mild Alzheimer's disease is associated with difficulties completing minor chores, such as balancing one's check book and grocery shopping, and moderate Alzheimer's disease can cause problems with basic life skills, such as bathing and dressing (Reisberg, Ferris, deLeon, Crook, & Haynes, 1987). Research suggests that people know relatively little about normal memory changes associated with aging compared to pathological memory deficits (Reese, Cherry, & Copeland, 2000). Additionally, older adults very often take normal, everyday forgetfulness as a sign of impending Alzheimer's disease (Cutler & Hodgson, 1996), or fear that normal forgetfulness may

lead to Alzheimer's disease (Reese, Cherry, & Norris, 1999). In reality, persons of any age can forget someone's name or where they put their car keys (Jarvik, 1980). However, misinformation and implicit theories about the course of cognitive development may lead one to mistake these common everyday memory failures as an indication of more serious mental problems (Sternberg, 1987).

People apply age stereotypes to themselves, and they also use stereotypes when judging the behavior of others. For example, Erber and her colleagues (Erber, 1989; Erber & Rothberg, 1991; Erber, Szuchman, & Rothberg, 1990a) have documented the existence of a double standard in which forgetful behavior is evaluated differently depending upon the age of the forgetful person. That is, everyday forgetfulness in older adults is seen as more serious (Erber, 1989), as a sign of impending mental difficulty (Erber et al., 1990a; Erber, Szuchman, & Rothberg, 1990b), and in need of professional evaluation (Erber & Rothberg, 1991). In contrast, identical memory failures in younger adults are seen as less serious (Erber, 1989) and are more likely to be attributed to lack of effort or inattention (Erber & Rothberg, 1991; Erber et al., 1990a; Erber et al., 1990b).

Regardless of whether the stereotype is positive or negative, messages in our culture about old people and what it means to grow old can influence our understanding of the aging process, as well as our perceptions of older individuals (Chanowitz & Langer, 1981). Hummert (1999) suggests that age as well as context can activate aging stereotypes. Implicit theories about the nature of cognition can drive the way people perceive and evaluate their own cognition, as well as the cognition of others (Greenwald & Banaji, 1995; Sternberg, 1987). Thus, an older person who is forgetful may activate a negative aging stereotype that can influence the judgments we make about that person. It is not clear from past research, however,

the degree to which knowledge of normative age-related memory changes is associated with perceptions people hold of older forgetful individuals. The main goal of the present investigation is to examine the relationship between memory knowledge and perceptions of forgetful others, particularly forgetful older adults. The outcomes of this study will provide important evidence for the relationship between veridical knowledge and implicit theories of cognitive aging.

The remainder of the introduction is organized as follows. First, research examining peoples' perceptions of forgetful younger and older adults is reviewed to highlight the advantages of the person perception paradigm used by Erber and colleagues (e.g., Erber et al., 1990a) and to illustrate the major findings in this area. The second section provides a selected review of the literature on metamemory, focusing on memory knowledge and self-referent beliefs about memory functioning. As shown in this section, the area of declarative knowledge of memory changes associated with normative development is relatively underrepresented in the cognitive aging literature. The third section reviews current findings on the effectiveness of educational programs on peoples' subjective beliefs about memory functioning. The goal of this section is to review current literature showing the effectiveness of memory intervention programs on changes in subjective memory beliefs, with the underlying assumption that memory intervention programs may also be effective in changing perceptions of forgetful others. In the final section, the specific aims of the research are outlined.

## **Perceptions of Older Adults**

### The Person Perception Paradigm

In 1989, Erber published her first study examining perceptions people hold of forgetful others. The primary impetus for Erber's work was the largely anecdotal assertion that

forgetfulness in older and younger individuals may be perceived differently. That is, “a memory failure considered ‘inconsequential’ in a young adult might be viewed in an older adult as a sign of impending senility” (Erber, 1989, p. 170). To examine differences in perceptions of older and younger adults, Erber used a person perception paradigm in which younger and older research participants read several short vignettes depicting forgetful fictitious individuals (i.e., targets). The types of forgetting described in the vignettes were based on Herrmann and Neisser’s (1978) “everyday” forgetfulness (e.g., forgetting names, lists, faces, etc.). The age of the target person described in the vignettes varied systematically such that half of the participants read vignettes depicting young forgetful targets (30-years-old) and the remaining participants read vignettes depicting old forgetful targets (70-years-old). Participants evaluated the targets’ memory failures on the dimension of “seriousness” using a 7-point Likert scale. Younger research participants, but not older research participants, perceived memory failures experienced by older forgetful individuals as more serious than identical memory failures experienced by younger individuals. Thus, initial findings supported the notion that younger adults use an age-based double standard in evaluating forgetfulness in others.

The main advantage of a person perception paradigm is that it allows for the situational context to remain constant (i.e., what is forgotten) while other variables are systematically varied (i.e., age of the target). For example, Erber (1989) held constant the specific forgetting episode, the context of the memory failure, as well as the personal characteristics of the target person depicted in each vignette. Consequently, the only difference between the vignettes was the age of the forgetful target described. Results from Kite and Johnson’s (1988) meta-analysis indicate that negative attitudes toward the elderly are more pronounced when minimal individuating information about the older person is provided to participants. Compared with studies that used

only a general label (e.g., old person), studies that used specific target persons found smaller differences between attitudes toward the elderly and attitudes toward the young. Kite and Johnson also found that perceived differences based on target age were more pronounced depending on experimental design; old targets were evaluated more negatively when the judgments were made in the same context (within-subjects designs) compared with when they were evaluated independently (as in between-subjects designs). In light of these findings, Erber (1989) employed a fairly conservative design in that participants were presented with identical vignettes that presented individualized information about target persons. Additionally, age of the target was treated as a between-subjects variable resulting in a fairly sensitive assessment of the age-based double standard. As discussed in the next section, the age-based double standard regarding memory failures in older versus younger adults has been replicated using more elaborate measures, such as causal attribution and memory opinion scales (Erber & Rothberg, 1991; Erber et al., 1990a, 1990b; see also Parr & Siegert, 1993).

#### Causal Attribution and Memory Opinion Judgments

In subsequent work Erber and colleagues examined negative perceptions of older adults' memory failures, extending the notion of "seriousness" by having participants make causal attribution evaluations as well as memory opinion evaluations. In Erber et al. (1990a), participants made judgments regarding six possible causes of the memory failures: lack of ability, lack of effort, difficulty of the task, bad luck, and two attention causes (all the things that might have been going on around the target person and all the things that might have been going on in the target person's mind). Participants were also asked three specific questions about the forgetful targets' memory: (1) degree of mental difficulty expressed in the memory failure, (2) need for memory training, and (3) need for professional evaluation.

The causal attribution scales were based on Weiner et al.'s (1971) attributional model, and can be delineated within two basic dimensions: stability (fixed vs. variable) and locus of causality (internal vs. external).<sup>1</sup> These dimensions can be combined to form a 2 x 2 matrix as shown in Table 1. Ability and task difficulty are believed to have somewhat enduring characteristics, whereas effort and luck are relatively variable. Further, ability and effort describe qualities internal to the person undertaking the activity, whereas task difficulty and luck are considered external to the person.

Table 1: Classification Scheme for Causal Attribution Judgments

Stability	Locus of Causality	
	Internal	External
Stable	Ability	Task Difficulty
Unstable	Effort	Luck

*Note.* Table adapted from Weiner et al. (1971)

Weiner et al. (1971) developed the attributional scheme to explain motivation in achievement-related situations. Causal attributions of past performance are important in understanding future behavior. If past performance is undesired (e.g., failing an exam) then there is some likelihood that an attempt will be made to alter the cause to produce a different (and hopefully, more positive) outcome. Thus, as an individual comes to understand the causes of previous outcomes, this information can help determine the best course of action to take in the future. Deaux (1976) elaborated on Weiner et al.'s conceptualization and applied the attribution scheme to expectancies people have about the behavior of stereotyped others. She argued that observers have expectancies for the behavior of others and these expectancies are influenced by

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<sup>1</sup>Weiner (1985) notes that these are not the only determinants or dimensions of successes or failures, but the most commonly evaluated, particularly in achievement-related domains.

stereotypes people hold. Behavioral outcomes that are expected for a particular stereotyped group will be attributed to stable rather than temporary causes (either internal or external) and unexpected outcomes for that group will be attributed to unstable or temporary causes (either internal or external). Deaux was primarily concerned with differences in expectations based on gender. She argued that stereotypes are at least one factor influencing expectancies and consequently, causal attribution of successes and failures reflect stereotypic views held by the perceiver (see also Blank, 1982). Intrigued by Deaux's hypothesis, Erber et al. (1990a) included causal attribution judgments as a further test of the existence of an age-based double standard in evaluations of older adults' memory failures. Erber et al. hypothesized that if people hold stereotyped views of older adults in which forgetfulness is expected, then they will be more likely to attribute an older person's memory failures to lack of ability or task difficulty, both stable causes. Alternatively, if people do not expect forgetfulness in younger adults, then they will be more likely to attribute a young person's memory failures to lack of effort or bad luck, both of which are unstable causes.

In general, Erber et al. (1990a) found that people do have more negative expectations of forgetfulness in older individuals compared to forgetfulness in younger individuals. Forgetting experienced by younger fictitious characters was more often attributed to inattention compared to forgetting experience by older fictitious characters. Additionally, forgetfulness in older characters was more likely to be perceived as a sign of mental difficulty and in need of professional evaluation ratings compared to forgetfulness in younger characters. These findings offered at least preliminary evidence for Deaux's (1976) attribution bias -- younger adults' forgetfulness was attributed to the unstable cause of attention. However, this study did not show that forgetfulness in older adults was more often attributed to stable causes (i.e., lack of ability or

task difficulty), although interpretation of the memory opinion data suggests a general consensus regarding the failing mental ability of older forgetful targets. Similar results were reported in Erber et al. (1990b), suggesting that expectancies do influence how younger and older individuals are perceived in the context of forgetting.

Even stronger support for Deaux's (1976) expectancy attribution bias was found in a subsequent study including photographs of the fictitious forgetful targets in addition to short vignettes depicting the forgetting episode (Erber & Rothberg, 1991). In this study, older adults' memory failures received higher lack of ability ratings compared to identical memory failures of younger adults, who received higher lack of effort *and* lack of attention ratings. These results are consistent with Deaux's attribution bias in that expected outcomes were attributed to a stable factor (i.e., older adults' lack ability) and unexpected outcomes were attributed to factors that are variable (i.e., lack of effort and inattention for forgetful younger adults), suggesting that the attributional process is influenced by expectations people have of older adults' memory performance. One particularly noteworthy aspect of this study is that the age-based double standard appears to be magnified when pictures of the fictitious targets are included in addition to information provided in the vignette.

Type of Memory Failure. Erber and colleagues have also examined perceptions based on the type of forgetting depicted in the vignettes. In Erber (1989) and Erber et al. (1990a), the type of forgetting was based on Herrmann and Neisser's (1978) factors of everyday forgetting (e.g., rote memory, which involves forgetting things like numbers and addresses; absentmindedness, which involves forgetting what one has just done or intended to do; memory for names, people, conversations, places, and errands; and, retrieval, which involves the inability to recall something that seems familiar). For example, in the *people* vignette, the target did not recognize someone

whom she had met in a different context, and in the *conversation* vignette, the target forgot what her friend had said and what she herself was about to say in a group discussion. Overall, very few differences were found among the vignettes with respect to ratings on the dependent measures, suggesting that the memory failures depicted in the vignette were comparable.<sup>2</sup>

In contrast, Erber et al. (1990b) and Erber and Rothberg (1991) used memory failures based on Atkinson and Shiffrin's (1968) information-processing model. Memory failures in these vignettes were categorized as short-term, long-term, and very long-term forgetting. In vignettes depicting short-term memory failures, the target forgot the information immediately after encoding. In the long-term memory vignettes, the target forgot information at a later time (e.g., from 30 minutes to several hours after encoding). In the very long-term memory vignettes, the target character forgot highly familiar and over-learned information (e.g., an often used recipe, a sibling's phone number, the name of a long-time friend). Findings from these studies suggest that very long-term memory failures are perceived more negatively than short- and long-term memory failures. That is, very long-term memory failures were evaluated as more indicative of mental difficulty and in need of professional evaluation than were short-term and long-term memory failures, which were viewed similarly. Additionally, very long-term memory failures received higher lack of ability ratings compared to short-term and long-term memory failures, which received higher lack of effort and lack of attention ratings. It is important to note that there were no interactions between target age and type of forgetting depicted in the vignette. That is, regardless of the age of the target person experiencing the memory failure, short- and long-term memory failures were judged similarly, but very long-term memory failures were perceived as indicative of more serious memory problems.

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<sup>2</sup>Small differences in vignettes were found. For example, the absentmindedness vignette received lower lack of ability ratings and the people vignette received higher task difficulty ratings compared to the other vignettes.

Age of Perceiver. In these studies, Erber and colleagues (Erber, 1989; Erber, & Rothberg, 1991; Erber et al., 1990a) included both younger (ranging in age from 18-32 years) and older (ranging in age from 63-81 years) research volunteers. As already noted, they found that evaluations differed depending on the age of the perceiver. For example, in the original Erber (1989) study two vignettes were constructed for each type of forgetting; one vignette was designed to be a more serious example of the forgetting (e.g., forgetting the name of a long-time friend) and the second was a less serious example of the forgetting (e.g., forgetting the name of a new acquaintance). Younger participants (Experiment 1) rated the memory failures of older targets as more serious regardless of seriousness category. In contrast, older participants (Experiment 2) did not rate the memory failures of younger and older target persons any differently. Erber et al. (1990a) found that older adults gave higher task difficulty ratings compared to younger adults, and on the memory opinion scales, younger adults gave higher mental difficulty and need for evaluation ratings compared to older adults. Erber and Rothberg (1991) found that younger adults considered very long-term memory failures more indicative of mental difficulty and need for medical evaluation compared to older adults. Taken together these results suggest that older adults may be more lenient in their evaluations of forgetful others. These findings are consistent with studies which have shown that older adults hold more elaborate conceptions about the course of development throughout the life span compared to younger adults. For example, Heckhausen, Dixon, and Baltes (1989) found that older and middle-aged adults endorsed a greater number of desirable or positive changes during adulthood than younger adults, who tended to focus primarily on negative changes. Kite, Deaux, and Miele (1991) found older adults to have more varied stereotypes and less negative perceptions about older fictitious targets compared to younger adults. Further, Lineweaver and Hertzog (1998)

found that young, middle-aged, and older adults perceived declines in various aspects of memory across the life span; however, older adults perceived the onset of decline to begin somewhat later in life than younger participants. Hummert (1999) argues that as individuals integrate their life experiences into their conceptions of aging, age stereotypes become more elaborate across the life span. Consequently, they may become more lenient in their evaluations of forgetful others.

Capability Impressions. In subsequent work, Erber and colleagues (Erber, Etheart, & Szuchman, 1992) began to examine the influence of forgetfulness on peoples' impressions of cognitive capability using task assignment scales rather than causal attribution and memory opinion scales. In Erber et al. (1992), participants rated the likelihood (using 7-point Likert scales) of assigning a target to several tasks that varied in degree of difficulty, from easy to difficult. Thus, task assignment ratings on easy versus difficult tasks as a function of target age provided an indication of how capable participants perceived forgetful target individuals. To set the stage for evaluating the capability of the forgetful individuals, this study presented younger and older research volunteers with information about a fictitious target interviewing for a volunteer position at a local school. Participants were to imagine themselves the supervisor of the volunteer program. Prior to listening to a taped session in which the fictitious target is "interviewed" for the position, participants were presented with a job application form containing information about the applicant. For half of the participants the application form indicated that the applicant was 32-years-old; the remaining participants received information that the applicant was 67-years-old. In addition to varying age of the job applicant, the researchers also varied the degree of forgetfulness experienced by the interviewee. During the interview session the applicant was portrayed as moderately forgetful (experienced 4 memory failures), highly forgetful (experienced 8 memory failures), or as not at all forgetful (experienced

no memory failures). Erber et al. (1992) hypothesized that the degree of forgetfulness as well as age of the target would influence task assignment ratings. Because of the age-based double standard found in previous work, they predicted that degree of forgetfulness would have a greater negative effect on perceivers' impressions of capability, particularly for old targets. Thus, they predicted that older highly forgetful targets would receive lower task ratings compared to younger highly forgetful targets.

Erber et al. (1992) found partial support for their hypothesis in that highly forgetful individuals received lower task assignments than did moderately forgetful individuals, who, in turn, received lower task assignments than non-forgetful individuals. Interestingly, participants did not differentiate task assignment based on age of the forgetful volunteer. That is, younger and older forgetful volunteers received similar task ratings. These studies suggest the importance of memory behavior in judging the capability of others. Erber, Prager, Williams, and Caiola (1996) reported similar findings for confidence ratings. Participants rated how confident they would be that a forgetful younger, middle-aged, or older museum volunteer could perform particular tasks. The tasks varied in terms of how much memory was required to perform each task (i.e., memory load). Confidence ratings varied according to task memory load, with highly forgetful individuals receiving lower confidence ratings for high memory-load tasks compared to low memory-load tasks. Participants gave similar confidence ratings to young, middle-aged, and old targets, suggesting that peoples' impressions of others are not based on age alone.

In related research, Cherry, Brigman, Burton, and Roecke (2000) and Cherry and Brigman (2002) found that under certain conditions, situational outcomes of the forgetting affected attribution and memory opinion judgments more so than age of the forgetful target. Both studies evaluated the influence of minor versus more severe consequences of forgetful

behavior on perceptions of forgetful young and old target characters. In Cherry, Brigman, et al. (2000), consequences affected primarily the forgetful target being evaluated. Results indicated that forgetful behavior resulting in more serious consequences for the forgetful character was viewed more negatively than forgetting that resulted in minor consequences, irrespective of the forgetful target characters' age. In a follow-up study, Cherry and Brigman (2002) examined the influence of minor versus severe consequences of forgetfulness when the consequences affected not only the main character, but others in his/her social environment as well. Under these conditions, old forgetful targets received higher lack of ability ratings and higher ratings on the mental difficulty scale compared to young forgetful targets who received higher attribution ratings for lack of effort.

In summary, research suggests that people hold more negative perceptions of forgetful older individuals than forgetful younger individuals, although situational variables (i.e., what is forgotten, the context of the evaluation, the consequences of the forgetting, and who is affected by the consequences) may mediate perceptions. In the next section, I will review the research on metamemory, focusing primarily on memory knowledge and beliefs about one's memory functioning, the two aspects of metamemory that are most relevant to the present investigation. Metamemory is a term used to describe a host of processes associated with "thinking" about thinking. What is not clear, however, is the degree to which veridical knowledge of age-related cognitive changes is associated with perceptions of forgetful older adults. This issue will be re-addressed in the Specific Aims section.

### **Metamemory**

Wellman (1983) defines metacognition as knowledge one possesses about the human information-processing system. He defines metamemory as a domain-specific case of

metacognition, relating specifically to the cognitive process of remembering (see also Schneider & Pressley, 1989). Declarative knowledge of memory processes is one component of metamemory (Hertzog & Hultsch, 2000; Wellman, 1983). Hertzog and Hultsch (2000) outline two additional categories of metamemory: the ability to monitor one's memory processes (e.g., knowing when and how to effectively use memory strategies) and beliefs about one's own memory functioning (e.g., personal beliefs about the efficacy of one's memory abilities). This review will focus primarily on the dimensions of memory knowledge and beliefs about memory functioning. For an excellent review on the domain of memory monitoring (i.e., age differences in memory predictions, feeling-of-knowing judgments, and judgments of learning), see Hertzog and Hultsch (2000).

One hypothesis guiding the early research on children's metamemory was the potential predictive relationship between memory knowledge (i.e., metamemory) and remembering behavior. For example, Flavell and Wellman (1977) hypothesized that younger children performed more poorly on memory tasks because of a lack of awareness or understanding of the processes required for intentional remembering (i.e., lack of knowledge about memory strategies may hinder current memory functioning). The underlying assumption was that more accurate knowledge is associated with the use of more appropriate memory strategies. This hypothesized relationship between metamemory and memory performance was adapted by cognitive aging researchers. Cavanaugh and Perlmutter (1982; see also Dixon, 1989) argue that knowledge is an important aspect of understanding age-related changes in memory performance. Thus, awareness of the contents of one's own memory, knowledge about appropriate strategies in particular, and in general, how the human memory system functions, as well as beliefs about the efficacy of one's memory are believed to be important contributors to age-related decrements in

performance on laboratory memory tasks (Cavanaugh & Perlmutter, 1982; Dixon, 1989).

Research examining the relationship between memory knowledge and memory beliefs on older adults' memory performance is discussed more fully in the sections that follow.

### Metamemory as Memory Knowledge

Hertzog and Hultsch (2000) note that there is very little empirical data regarding declarative knowledge about cognition. The work that has been done has used questionnaires to assess self-reported memory knowledge. For example, one of the first self-evaluations of memory knowledge was developed by Perlmutter (1978). Using 10-point Likert rating scales, this questionnaire included 60 items assessing participants' thoughts about 4 areas of memory functioning: the types of memory problems faced in day-to-day activities (problems), expectations about memory change with age (change), memory strategies used (strategies), and things that are easy and difficult to remember (knowledge). Perlmutter found that older adults reported experiencing more memory problems than younger adults. Additionally, they reported greater expectations of memory loss in the future compared to younger adults. No age differences were found in reported strategy use or in knowledge about memory functioning. Both age groups reported that it was easier to remember material that is related, organized, interesting, and concrete, demonstrating memory knowledge that is consistent with findings regarding objective memory performance from the cognitive psychology literature. Perlmutter also examined the relationship among these various aspects of metamemory and objective memory performance on a range of laboratory tasks (e.g., incidental learning, intentional learning, free recall, recognition recall, etc.). She found only a small correlation between memory knowledge and objective memory performance, and no significant correlation between strategy use and memory performance. Perlmutter took this as evidence that there may be more

than differences in memory knowledge driving the metamemory-memory performance relationship in older adulthood.

Dixon and Hultsch (1983) developed another measure of metamemory, called the Metamemory in Adulthood (MIA) questionnaire. This questionnaire assesses several aspects of metamemory, but two subscales relate specifically to the dimension of memory knowledge. First, the *task* subscale assesses knowledge of basic memory processes, as evidenced by how most people perform on a given task (e.g., For most people, facts that are interesting are easier to remember than facts that are not.). Second, the *strategy* subscale measures knowledge of specific strategies in terms of personal use (e.g., Do you write appointments on a calendar to help you remember them?). Participants use five-point Likert scales to assess their knowledge of memory and strategy usage. In Dixon and Hultsch (1983) and Hultsch, Hertzog, and Dixon (1987) the MIA was given to several samples of younger and older adults. Age differences in the task and strategy subscales were found in some, but not all samples. For example, two samples of younger adults scored significantly higher on the task subscale of the MIA than older adults, but no age differences were found on the strategy subscale in these samples (Dixon & Hultsch, 1983). In another study, age differences were found on the strategy subscale, favoring younger adults (Hultsch et al., 1987). Hertzog and Hultsch (2000) note that younger adults may show superior knowledge about memory and cognition compared to older adults because of sampling procedures that include undergraduate college students. That is, experiences associated with college attendance may explain this finding more so than a developmental loss of strategy use in older adulthood. With respect to the predictive relationship between memory knowledge and task performance, Hertzog, Dixon, and Hultsch (1990a) found that the task and strategy

subscales of the MIA were not significantly correlated to performance on word and text recall tasks.

Similar to Perlmutter's (1978) questions about memory problems and memory changes, the MIA also assesses five other dimensions of metamemory, including beliefs about one's current memory capacity (capacity), perceived changes in memory functioning (change), anxiety related to memory functioning (anxiety), one's sense of control over memory functioning (control), and motivation to perform well on cognitive tasks (achievement). Although it appears that older adults have comparable memory knowledge to that of younger adults (i.e., no age differences in some samples on the task and strategy subscales), fairly consistent age differences have been found with respect to the capacity, change, and control subscales (e.g., Dixon & Hultsch, 1983; Hultsch et al., 1987). That is, older adults report less memory capacity, more changes in memory functioning (i.e., declines), and believe they have less control over their memory ability than younger adults. As reported earlier, Perlmutter (1978) found similar results, with older adults reporting greater memory problems and greater expectations of future memory decline compared to younger adults. Thus, echoing Perlmutter's findings, Hertzog et al. (1990a; Hertzog, Dixon, & Hultsch, 1990b) concluded that the relationship between memory knowledge and objective memory performance in adulthood may be different than that hypothesized by Flavell and Wellman (1977); instead of age-related differences in memory knowledge, age differences in subjective memory beliefs may be mediating observed age-related differences in objective memory performance.

#### Metamemory as Beliefs about Memory Functioning

Hertzog et al. (1990b) argue that beliefs about memory functioning may be equally important to older adults' memory performance as memory knowledge. They distinguish beliefs

in the form of memory self-efficacy (i.e., sense of efficacy related to memory functioning) from memory knowledge in that an older adult may have extensive and accurate knowledge of memory functioning while simultaneously believing that his or her ability to remember in a given context is poor (see also Hertzog, Dixon, Schulenberg, & Hultsch, 1987).

Several self-assessment questionnaires have been developed to assess self-referent memory beliefs. In addition to Dixon and Hultsch's (1983) MIA questionnaire, researchers have also used the Memory Functioning Questionnaire (MFQ) developed by Gilewski, Zelinski, and Schaie (1990) to examine beliefs about memory functioning. The MFQ contains 64 items assessing four factors of self-perceived memory functioning: how often specific types of everyday forgetting are experienced (frequency of forgetting), perceived seriousness of everyday forgetting (seriousness of forgetting), current memory ability compared to past memory ability (retrospective functioning), and usage of specific mnemonics/strategies known to aid memory (mnemonics usage). Results of hierarchical regressions found that age, health, and educational level accounted for only small amounts of variance in the MFQ; thus, the authors concluded that the MFQ measures perceptions of memory functioning independent these factors. To assess age group differences on the various subscales of the MFQ, Brigman, Cherry, and Roecke (2000) gave the MFQ to groups of younger and older adults. Age group differences were found on the retrospective functioning subscale, but not the frequency of forgetting, seriousness of forgetting, and mnemonics usage subscales, suggesting that older adults have more negative self-assessments of current memory functioning compared to past memory functioning than younger adults.

The main difference between the MFQ and the MIA is that the MFQ is narrower in scope. The MIA assesses several broad constructs related to metamemory (e.g., perceptions of

capacity as well as locus of control), whereas the MFQ focuses on self-perceived memory functioning in very specific everyday memory contexts (e.g., forgetting names, faces, appointments, etc.). However, the MFQ was designed to examine individual differences in constructs similar to those assessed by the MIA strategy, change, and capacity subscales. Both the MIA questionnaire and MFQ show high levels of internal consistency and factorial validity with respect to their subscales (Dixon & Hultsch, 1983; Gilewski et al., 1990). Additionally, Hertzog, Hultsch, and Dixon (1989) report the convergent validity of the MFQ frequency of forgetting subscale and the MIA capacity subscale to form a higher-order factor identified as Memory Self-Efficacy. In summary, both the MIA and MFQ appear to provide a global assessment of memory self-efficacy, which appears to have at least a modest correlation to actual memory performance (Hertzog et al., 1990b).

It is important to note, however, that both the MIA and MFQ require participants to make subjective evaluations of memory functioning, particularly with respect to memory knowledge and strategy use (Dixon, 1989). For example, the MIA task and strategy subscales require participants to make judgments using a Likert rating scale, ranging from “strongly agree” to “strongly disagree”; the MFQ assess mnemonics usage on a scale of “always” to “never”. Neither of these questionnaires assess veridical knowledge of memory functioning (e.g., against an objective criterion of correct/incorrect). Additionally, these assessments do not measure what people know (and, conversely, do *not* know) about changes in memory functioning associated with age. In other words, veridical knowledge of age-related memory changes is not addressed with either the MFQ or MIA questionnaires.

## Knowledge of Memory Aging

An important question from a metamemory perspective is: What do people know about age-related memory changes? The Knowledge of Memory Aging Questionnaire (KMAQ) was specifically developed by Cherry, West, Reese, Santa Maria, and Yassuda (2000) to assess laypersons' knowledge of normative memory changes and nonnormative memory deficits associated with later adulthood. One goal of the KMAQ is to provide a measure of veridical knowledge of memory aging. The KMAQ consists of 28 true/false items. The normative (i.e., normal) memory aging items represent a broad range of topics drawn from the cognitive aging literature (e.g., memory organization/systems, episodic memory phenomenon, encoding/retrieval factors, mnemonics/memory strategies, and individual difference and contextual influences on memory). For example, "Regardless of how memory is tested, younger adults will remember far more material than older adults", is a normal memory aging item assessing knowledge of memory organization/systems. Nonnormative (i.e., pathological) memory aging items represent an equally diverse range of topics (e.g., types of abnormal deficits, identification of abnormal deficits, mental health conditions affecting memory, physical health conditions affecting memory, and adult dementia/Alzheimer's disease). The item, "Confusion and memory lapses in older people can sometimes be due to physical conditions that doctors can treat so that these symptoms go away over time", is an example of a pathological memory aging item assessing knowledge of physical health conditions (as opposed to Alzheimer's disease) that can affect memory.

The KMAQ has been given to various samples of younger and older adults. In general, the findings suggest that people know less about normal memory aging compared to pathological memory aging. For example, Cherry, West, et al. (2000) found that not only community-

dwelling older adults knew less about normal memory aging compared to pathological memory aging (Experiment 2), but that mental health professionals also knew less about normal compared to pathological memory aging (Experiment 1). Reese et al. (2000) compared the performance of younger adults to older adults on the KMAQ and found that although older adults know more about memory aging in general, both groups demonstrated less knowledge of normal memory aging compared to pathological memory aging. Although they did not find the expected interaction between question type and participant age, age group differences were noted with respect to topical rubric. Older and younger adults demonstrated differences in knowledge within the specific topical areas comprising the normal and pathological memory aging dimensions of the KMAQ, suggesting that certain experiences may be attributing to group differences in memory aging knowledge (see also Cherry, Brigman, Hawley, & Reese, 2003). The most important finding regarding this work, however, is that in general people know less about normal memory aging compared to pathological memory aging. This point is re-addressed the Specific Aims section.

An important distinction between memory knowledge as assessed by the KMAQ and other measures of memory knowledge (e.g., Dixon & Hultsch's, 1983, MIA Questionnaire and Gilewski et al.'s, 1990, MFQ) is that the KMAQ focuses on veridical knowledge of age-related declines in memory functioning rather than subjective evaluations of memory knowledge and memory functioning. Thus, the KMAQ answers the question: what *do* people know about memory aging? One conclusion from research using the KMAQ is that people know relatively little about normal memory changes associated with age (e.g., Reese et al., 2000). However, an important unanswered question relating to the present study concerns the possibility that “lack”

of knowledge may influence perceptions of one's own forgetting as well as the forgetting of others; a question addressed in the current study.

The next section will provide a selected review of the memory-training literature. The primary aim of the present study was to examine the relationship between memory knowledge and peoples' perceptions of forgetfulness in others. One approach to answering this question involves an explicit attempt to increase memory-aging knowledge by exposing participants to an educational seminar in which the topic is memory aging. The underlying assumption is that as knowledge of normative, age-related memory changes increases, there will be a corresponding change in appraisals of forgetful others, a question which has not been addressed in the cognitive aging literature to date. Thus, the following section will focus primarily on memory intervention programs that have shown to be effective at changing self-referent beliefs of personal memory functioning.

### **Changing Perceptions**

#### Memory Intervention Programs: Changing Objective Memory Performance and Subjective Memory Beliefs

Improving memory is not a new topic in the cognitive aging literature. Memory interventions programs have focused primarily on two outcomes: changing objective memory performance (e.g., Schaie & Willis, 1986) and changing subjective beliefs about memory functioning (e.g., Turner & Pinkston, 1993). Programs that focus on changing objective memory performance often focus on teaching participants specific mnemonics techniques. In general, the effectiveness of memory training on older adults' objective memory performance has been fairly well documented, although effectiveness varies as a function of specific training (for a review see Dunlosky & Hertzog, 1998). For example, Verhaeghen, Marcoen, and Goossens (1992) conducted a meta-analysis examining the effectiveness of memory intervention programs that

taught older adults specific mnemonic strategies. They compared pretest-posttest performance gains of treatment groups to pretest-posttest performance gains of no-treatment control groups and placebo groups. Three results are noteworthy. First, examining only studies that included both a control group and a mnemonic training group, they found that older adults benefited more from mnemonic training than either control (usually in the form of a test-retest group) or placebo treatments (treatment programs with no mnemonics training). Second, effect sizes for the memory-training groups showed much variability, suggesting that the effectiveness of the training was dependent on the specific mnemonic technique taught. In contrast, control and placebo groups had comparably homogeneous effect sizes, suggesting that these groups are essentially equivalent. Third, the effects of mnemonic training appear to be specific, with the most improvement on memory tasks specific to the newly acquired mnemonic.<sup>3</sup>

Studies have also focused on improving older adults' beliefs about memory functioning. The underlying assumption is that changes in subjective memory beliefs are expected to have a corresponding influence on objective memory performance (Bandura, 1989; Cavanaugh & Green, 1990). Programs designed to improve subjective memory beliefs often focus on improving beliefs about memory aging by increasing memory self-efficacy and feelings of personal control over memory functioning. Memory self-efficacy encompasses beliefs about one's ability to perform a given memory task (Berry, 1999). Personal control focuses on individuals' beliefs about whether the outcomes are contingent upon their own behavior or due to things beyond their control (Bandura, 1997). Beliefs about memory functioning can be conceptualized as *adaptive* or *maladaptive* (Elliot & Lachman, 1989; Lachman, Weaver, Bandura, Elliott, & Lewkowicz, 1992). An adaptive view of memory aging focuses on memory

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<sup>3</sup>Research suggests that older adults can effectively learn to use visual imagery techniques (e.g., the Method of Loci) to remember word lists. However, older adults are less likely to use these methods in everyday life (for a review see, Cherry & Smith, 1998)

as a skill that can be maintained and improved with effort (i.e., skills view of memory). In contrast, beliefs in which age is seen as a cause of memory deficits that are inevitable and uncontrollable (i.e., shrinking entity view of memory) are considered maladaptive. Miller and Lachman (1999) argue that older adults' objective memory performance is worse than younger adults' memory performance because they hold negative views of memory aging. That is, they are more likely to attribute failures to internal, stable factors (e.g., low ability) than younger adults. This attributional pattern is believed to be associated with decreased motivation, less effort, and consequently, poorer performance on cognitive tasks (Elliot & Lachman, 1989).

In general, memory-training programs have been at least mildly successful at improving subjective perceptions of memory functioning, although the magnitude of success depends on the content of the training program and the specific measures used to assess memory beliefs. Turner and Pinkston (1993) designed a memory intervention program to increase veridical knowledge of memory aging. The 2½ hour workshop consisted of interactive lectures on memory processes and functions, age-related changes in memory, and non-age-related factors that interfere with memory functioning regardless of age (e.g., memory problems associated with stress, grief, and depression). Workshop attendees included older ( $M$  age = 69.8 years) and younger ( $M$  age = 23.8 years) adults who reported at least three memory functioning complaints. Subjective beliefs about memory functioning were assessed at pretest and posttest using Dixon and Hultsch's (1983) MIA questionnaire. To assess memory knowledge, participants also answered several true/false statements about memory functioning (e.g., Poor memory is often due to poor observation) before and after the workshop. Turner and Pinkston found that compared to a wait-list control group, older participants (but not younger adults) attending the memory intervention workshop showed significant pre- to posttest improvement on the Control subscale of the MIA.

That is, after the workshop older adults reported a greater sense of control over memory functioning compared to younger adults attending the workshop. Pretest differences between younger and older adults in control beliefs may be responsible for age differences on the Control subscale. That is, younger adults had higher pretest control beliefs compared to older adults, suggesting that they already had relatively high internal control beliefs about memory prior to training. Younger adults (but not older adults) showed pre- to posttest differences on the Anxiety subscale of the MIA, suggesting that younger adults felt less anxious about their memory functioning after the workshop. Participants not attending the workshop showed no changes from pretest to posttest on any of the MIA subscales. Additionally, younger and older workshop attendees were more accurate on the true/false quiz compared to participants not attending the workshop. Because objective memory performance was not assessed in this study, it is not clear if changes in subjective memory belief had a subsequent affect on objective memory performance.

Schmidt, Zwart, Berg, and Deelman (1999) examined the effectiveness of a memory intervention workshop on self-perceptions of memory functioning as well as objective memory functioning. Participants were selected based on the presence of memory complaints and the presence of objective memory problems (as assessed by performance on a name-face association task). The intervention program focused primarily on educating participants about memory functioning (i.e., specific mnemonic techniques and strategies were not taught in the workshop). The program consisted of six 1-hour sessions over a 3-week period, and focused on aspects of memory that remain intact, identifying false beliefs about memory aging, and stressed cognitive competency in later adulthood. In essence, the program promoted the adaptive view of cognitive aging. Using Likert rating scales, participants assessed five areas of memory functioning before

and after the memory workshop: frequency of forgetting, current memory capacity, knowledge about memory functioning, ability to cope with memory problems, and acceptance of memory problems. Except for frequency of forgetting (which assessed the frequency of 28 everyday memory situations), evaluations of perceived memory functioning were assessed with only a single question for each aspect of memory beliefs. Differences in subjective memory reports as well as performance on objective memory tasks before and after the intervention program were compared to a no-contact control group. Although the main effect of group was not significant in this study, there were two metamemory questions that showed a group by time of testing interaction. Older adults (aged 45-84) participating in the intervention program showed a significant pre- to posttest increase in memory knowledge and reported that they were less troubled by their forgetfulness at posttest compared to participants in the control group. Further, these effects were maintained at follow-up 3-months after the intervention program. No differences were found for the remaining three subjective reports (frequency, capacity, and coping) at posttest or at follow-up. Schmidt et al. (1999) did not find comparable increases in objective memory performance, although training on specific mnemonic strategies or techniques was not included in the intervention workshop. These data suggest that memory intervention programs are helpful in changing some aspects of metamemory (i.e., knowledge of memory functioning and acceptance of one's forgetfulness).

Although general findings suggest that self-perceived memory functioning can be improved as a result of memory intervention programs, improvements are not consistently found in all measures of metamemory. Floyd and Scogin (1997) conducted a meta-analysis of the memory-training literature and found differences in training effectiveness as a result of training format. In particular, they found that memory interventions that promoted a realistic view of the

aging process and its effects on memory capabilities (i.e., expectancy modification) in addition to training on specific mnemonic techniques had the greatest influence on subjective memory evaluations at posttest. Additionally, they compared their findings to the findings of Verhaeghen et al. (1992) reported earlier and found that the magnitude of improvement on subjective perceptions of memory was not as great as that found with respect to improvement on objective measures of memory performance. Although not conclusive based on the findings of the meta-analysis, Floyd and Scogin suggest that subjective memory evaluations are more resistant to change than is actual memory performance (see also Dunlosky & Hertzog, 1998). Additionally, Dunlosky and Hertzog (1998) maintain that inconsistencies in training effectiveness may be due in part to the variations in how memory beliefs are assessed. These conclusions are consistent with the two studies reported above which found post-training differences in some metamemory assessments but not others.

#### Changing Perceptions of Forgetful Others

From past research we can conclude that memory intervention programs can positively influence perceptions of one's own memory functioning (at least on some self-evaluation measures). However, whether memory intervention programs can influence perceptions of others' memory has not been specifically addressed in the cognitive aging literature to date. At least one experiment has made an attempt to address the relationship between stereotypes people hold of older adults and perceptions of forgetfulness. Using the person perception paradigm, Guo, Erber, and Szuchman (1999) examined the modifiability of perceptions of forgetful others by first providing participants with information about memory aging that was either stereotype-consistent or stereotype-inconsistent. Participants read a "recently published" article that either stated memory declines with age (i.e., stereotype-consistent information) or that memory is

constant across the adult years (i.e., stereotype-inconsistent information). A third control group was included that did not read any article about memory aging. Participants then read a script depicting either a younger or older fictitious person being interviewed for a volunteer position. In the script, the potential volunteer experienced three memory failures and participants rated the target person's memory and the likelihood of two possible causes of the target's memory failures: lack of ability and lack of effort. It was expected that age stereotypes would be weakened for participants reading the stereotype-inconsistent information and as a result, negative attributions based on target age would be weakened as well. Results suggested a partial confirmation of their predictions. Younger adults exposed to stereotype-consistent information did give higher lack of ability ratings to older forgetful targets than to younger forgetful targets. Young adults given stereotype-inconsistent information did not rate younger and older forgetful targets any differently with respect to ability. This effect was not found with older adults exposed to stereotype-consistent or inconsistent information. Complicating the interpretation of these results, the no-information control group performed similarly to the stereotype-inconsistent group. That is, older participants in the experimental condition as well as participants in the control condition rated younger and older forgetful targets similarly with respect to ability attributions.

In essence, the age-based double standard was not replicated in this study, however there are several methodological differences in this study compared to the original studies reporting this finding (e.g., Erber et al., 1990a). First, rather than rating multiple targets across several contexts, participants in this study rated only one forgetful individual in a single context. Second, the forgetful target depicted in the vignette experienced numerous instances of forgetting in a relatively short duration (e.g., 3 memory failures during a 5-minute job interview).

Lastly, this study asked participants to evaluate the target using only two causal attribution scales, effort and ability, rather than the range of possible causes used in previous studies. It is possible that these methodological differences contributed to the null results for participants in the control group, who presumably hold at least moderate memory aging stereotypes. This research does provide some preliminary evidence suggesting that written information consistent with current memory and aging stereotypes influences judgments made about older forgetful individuals, if only for younger perceivers. However, these results do not address the potential success of more specific and explicit memory intervention programs such as those described above (e.g., Schmidt et al., 1999; Turner & Pinkston, 1993). Thus, the question of whether increasing veridical knowledge of memory aging would result in less negative perceptions of forgetful older adults is left unanswered.

### **Specific Aims**

The primary aim of the present study was to examine the relationship between memory knowledge, a dimension of metamemory, and younger and older adults' appraisals of others' memory. As described earlier, previous research has identified an age-based double standard with respect to peoples' perceptions of memory failures experienced by fictitious older individuals. That is, everyday memory failures in older adults are viewed as more serious (Erber, 1989), are more likely to be attributed to failing mental ability (Erber & Rothberg, 1991), and are more likely to be recommended for a medical evaluation (Erber et al., 1990a) than identical memory failures of younger adults, which are more likely to be attributed to lack of effort or inattention (Erber & Rothberg, 1991; Erber et al., 1990a, 1990b; see also Parr and Siegert, 1993). Previous research also indicates that people know relatively little about normative age-related memory changes compared to pathological memory deficits related to

disease and dementia (e.g., Reese et al., 2000). To date, no published studies have examined the relationship between veridical knowledge of age-related changes in memory functioning and perceptions of everyday forgetfulness in older adults. Thus, this research fills a noteworthy gap in the literature on perceptions of forgetfulness in later adulthood.

The relationship between memory knowledge and appraisals of forgetful others was examined in two ways. First, from an experimental approach, knowledge of age-related memory changes was treated as an independent variable. That is, research volunteers either received or did not receive information about age-related memory changes in later adulthood. Then, group differences in causal attribution judgments and memory opinion evaluations were examined (following the procedures of Erber et al., 1990a). Second, knowledge of normative age-associated memory changes was treated as an individual difference variable. To this end, knowledge of memory aging was assessed at pretest using the Knowledge of Memory Aging Questionnaire (KMAQ; Cherry, West, et al., 2000) and examined in relation to ratings on the causal attribution and memory opinion scales. In both the experimental and individual differences approach, knowledge of normative memory aging issues is expected to be associated with more positive perceptions of forgetful older adults. These two approaches are discussed more fully below.

### Experimental Approach

Memory Knowledge and Memory Evaluations. Previous studies have shown that subjective beliefs about memory functioning can be improved with memory intervention programs focused on educating participants about memory aging (e.g., Floyd & Scogin, 1997; Schmidt et al., 1999; Turner & Pinkston, 1993; Verhaeghen et al., 1992). However, it is not clear whether memory intervention programs can influence perceptions of others' memory

failures. To address this question, participants in this study were either given no information about memory aging (control group), given information about social functioning in later adulthood (grandparent seminar group), or given specific information about cognitive functioning in later adulthood (memory aging seminar group). The grandparent seminar focused on the importance of the grandparent-grandchild relationship, but provided no information about memory aging. The memory aging seminar was comparable in length and format to the grandparent seminar, but focused on normative changes in memory functioning associated with age. Additionally, the memory aging seminar distinguished between normative memory changes and pathological memory deficits and promoted an adaptive view of memory aging (Lachman et al., 1992), focusing on the importance of effort in maintaining and improving memory functioning throughout the life course.

To assess gains in memory aging knowledge, participants completed the Knowledge of Memory Aging Questionnaire at pretest and posttest. As noted previously, the KMAQ assesses objective knowledge of normative memory changes and pathological memory deficits associated with later adulthood. Studies have shown that knowledge of memory aging can be improved as a result of instruction (Cherry et al., 2003; Cherry, West, et al., 2000). For example, Cherry et al. (2003) found that after receiving a two-part lecture covering normal and pathological memory changes in adulthood, college students' overall performance improved on the KMAQ. Additionally, participants were less likely to endorse the "don't know" response option at posttest compared to pretest, suggesting that they were more assured in their answers after receiving the information on memory aging. Based on these findings, participants in the present study receiving specific information about age-associated normative memory changes were expected to show significant pre- to posttest performance gains on the normal KMAQ items

compared to participants who received no information about memory aging. No such gains were expected on pathological memory KMAQ items.

To assess perceptions of forgetfulness, participants read several short vignettes depicting either younger (25-35 years old) or older (65-75 years old) fictitious individuals (i.e., *targets*) experiencing identical instances of everyday forgetting (e.g., forgetting the name of a new acquaintance). Following Erber et al. (1990a), participants made attribution judgments regarding the perceived causes of the forgetting: lack of ability, effort, task difficulty, bad luck, and two measures of attention (external and internal distractions). Participants also evaluated the targets' memory in terms of whether the forgetting was (a) a sign of mental difficulty, (b) in need of memory training, and (c) in need of professional evaluation (either medical or psychological). Participants receiving the memory aging information were expected to have more positive perceptions of forgetful older targets than participants in either the grandparent or no information control group (expected participant age group differences are discussed below). That is, increased veridical knowledge of memory aging was predicted to result in individuals making fewer distinctions between everyday forgetfulness experienced by younger and older fictitious forgetful adults. Thus, participants not attending the memory aging seminar were expected to show the age-based double standard found in the Erber et al. studies (Erber & Rothberg, 1991; Erber et al., 1990a, 1990b).

A pattern of outcomes consistent with this prediction would suggest that memory appraisals of forgetful others, particularly forgetful older adults, are linked to differences in knowledge domain, specifically knowledge of normative age-related memory changes; thus, indicating that negative perceptions of older adults are amendable through explicit educational programs. It is believed that implicit views of cognitive aging are driving how older persons are

perceived in forgetful contexts (Erber & Prager, 1999). Hummert (1999) suggests that age as well as context (e.g., an older adult who is forgetful) activates negative aging stereotypes in perceivers, which then influences judgments made about the forgetful person. Although explicit beliefs have been shown to operate independently of implicit beliefs in social cognitive judgments (e.g., Devine, 1989), Hess (1999) argues that the impressions people form of others also depends on the knowledge he or she brings to the situation. Thus, the goal of the present investigation was to examine the effects of memory aging knowledge on perceptions of forgetful older adults.

If increasing veridical knowledge of age-related changes in memory functioning can modify how older adults are perceived, these results could have important applied implications. For example, training programs for individuals working in applied aging areas, such as nursing homes, assisted-living centers, and adult day-care programs, could be developed to help ensure individuals understand and are aware of distinctions between normative and pathological memory aging. In turn, this could have an important influence on how older adults, particularly older adults experiencing only normative cognitive declines, are perceived and treated in these environments. The outcomes of this study will provide important evidence for the relationship between veridical knowledge and implicit theories of cognitive aging.

Self-Perceived Memory Functioning. An additional goal of this study was to examine the relationship between perceptions of one's own forgetfulness and perceptions of forgetfulness in others. To examine this relationship, participants completed the Memory Functioning Questionnaire (Gilewski et al., 1990) as an assessment of self-perceived memory functioning. The MFQ was selected for inclusion in this study because it has good psychometric properties (good internal consistency as well as convergent validity with the MIA; Hertzog et al., 1989) and

because it provides a measure of self-perceived memory functioning in specific areas of everyday memory (as opposed to the MIA's general measure of metamemory). A more practical reason for using the MFQ is that it contains only 64-items (versus 108 items on the MIA) and can be completed in approximately 15 minutes, minimizing the possibility of participant fatigue. Additionally, research suggests that the MFQ is conceptually distinct from the KMAQ (Brigman et al., 2000), suggesting that these two assessments are measuring different aspects of metamemory.

Previous research suggests that memory intervention programs can effectively increase perceptions of one's own memory functioning (e.g., Turner & Pinkston, 1993). In terms of the present investigation, it is possible that after receiving information on memory aging participants, particularly older participants, will evaluate their own forgetting less seriously compared to participants receiving no information about memory aging. In the memory aging seminar, participants were educated on the distinction between normative and pathological memory aging, exposed to specific examples of everyday forgetting, and, as noted previously, exposed to the view that memory is a skill that can be maintained with effort. Thus, if this message is effective, older participants in the memory aging group were expected to have more positive views of their own forgetting compared to older participants not receiving this information. No differences were expected for younger adults attending the memory aging seminar because younger adults tend to have fairly good self-perceived memory functioning in general.

Role of Participant Age. A third aim of this research was to examine adult age differences in the modifiability of perceptions by comparing judgments made by younger and older research volunteers. Younger and older perceivers may be differentially influenced by the

information presented in the memory aging seminar. Previous research on memory appraisals suggests that older adults are more lenient in their perceptions of forgetful others. That is, Erber (1989) found that older adults rated forgetfulness in others as less serious than did younger adults. Erber et al. (1990a) also found that older adults were more likely to attribute memory failures to external causes (i.e., task difficulty) compared to younger adults. Other research suggests that older adults have more differentiated stereotypes of older individuals (e.g., Kite et al., 1991). Hummert (1999) argues that older adults' experiences with the aging process may contribute to more elaborate conceptions of older adulthood, specifically with respect to cognitive aging (see also Hess, 1999, and Lineweaver & Hertzog, 1998). Consequently, older research participants in this study were predicted to be more receptive to the memory aging seminar than younger participants, and as a result, show more positive perceptions of forgetful others compared to younger participants attending the memory aging seminar.

#### Individual Differences Approach

Another approach to examining the relationship between memory knowledge and perceptions of forgetful others is to address the question from an individual difference perspective. It is plausible that differences in memory appraisals of forgetfulness in older adults may be attributed to preexisting differences in knowledge of developmental changes in memory functioning. The present research was designed to address this question. For participants not attending the memory aging seminar, analyses were conducted to determine whether there was a significant relationship between knowledge of memory aging and perceptions of forgetful targets. As mentioned previously, memory knowledge was assessed with a pretest administration of the KMAQ. If the predictions from the experimental approach hold true, then

individuals who have a better understanding of memory aging (i.e., higher pretest KMAQ scores) were expected to also hold more positive perceptions of forgetful individuals.

To summarize, it was expected that knowledge of normative, age-related memory changes associated with later adulthood would be associated with more positive memory appraisals of forgetful older targets. That is, those attending the memory aging seminar were predicted to show more positive perceptions of forgetful older adults than those assigned to either of the control groups, who were expected to demonstrate the age-based double standard in perceptions of forgetfulness (Erber & Prager, 1999). Gains in memory-aging knowledge were expected to affect younger and older adults' memory appraisals, but, as discussed earlier, age group differences were expected to emerge even after participation in the memory aging seminar, with older adults showing more positive perceptions than younger adults. Lastly, individual differences in memory knowledge as reflected by scores on the KMAQ at pretest were expected to correlate with causal attribution and memory opinion evaluations of forgetful individuals. Such a pattern of outcomes would provide important new evidence on the hypothesized relationship between memory knowledge and memory appraisal in adulthood.

## METHOD

### Participants

In all, 192 individuals participated in this study.<sup>4</sup> Ninety-six younger adults between the ages of 18 and 26 years ( $M = 20.04$  years,  $SD = 1.60$ ) were recruited from the Louisiana State University (LSU) Department of Psychology undergraduate research participant pool. The majority of younger adults were female (87.5%), white (82.3%), and single (100%). Ninety-six community-dwelling older adults between the ages of 58 and 85 years ( $M = 72.36$  years,  $SD = 5.54$ ) were recruited from local churches and civic organizations. The majority of older adults were female (72.9%), white (97.9%), and married (65.6%). Undergraduate volunteers received extra credit in exchange for their participation; older research volunteers were paid \$10.00 each for their participation.

Participants completed a demographic questionnaire soliciting information regarding educational attainment and occupational level (younger participants were asked about the educational level and occupational level of same-sex parent). Three self-perceived health questions from the Older American Resource and Services Multidimensional Functional Assessment (OARS; Duke University Center for the Study of Aging and Human Development, 1975) were also included on the questionnaire. As shown in Table 2,  $t$ -tests revealed a significant main effect of age on educational level,  $t(186) = -2.07$ ,  $p = .04$ , with older adults ( $M = 5.70$ ) reporting higher educational attainment than younger adults ( $M = 5.40$ ). No age differences were found on occupational level ( $p = .06$ ). Overall, participants generally reported good health. However, analyses of self-ratings for health at present time yielded a significant main effect of age,  $t(190) = -2.27$ ,  $p = .02$ , with older adults ( $M = 2.07$ ) rating their present health

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<sup>4</sup>Due to scheduling conflicts, twelve participants (6 younger adults and 6 older adults) were unable to attend the second experimental session and are not included in this total.

as poorer than younger adults ( $M = 1.80$ ). Additionally, older adults ( $M = 1.90$ ) were more likely to report that their health interfered with activities than were younger adults ( $M = 1.53$ ),  $t(190) = -2.75$ ,  $p = .007$ . When evaluating their health in comparison to others their age, older adults ( $M = 1.83$ ) gave lower ratings than younger adults ( $M = 2.69$ ),  $t(190) = 6.45$ ,  $p < .001$ , suggesting that the older adults in this study maintained an optimistic view of their current health status in comparison to age matched peers.

To assess group differences in verbal ability and depressive symptoms, participants completed a vocabulary test (Gardner & Monge, 1977) and the Geriatric Depression Scale-Short Form (GDS; Yesavage et al., 1983). As shown in Table 2, older adults ( $M = 19.73$ ) demonstrated greater vocabulary knowledge than younger adults ( $M = 12.61$ ),  $t(190) = -10.80$ ,  $p < .001$ , a typical finding in the cognitive aging literature. Additionally, older adults ( $M = 1.09$ ) scored significantly lower on the GDS than younger adults ( $M = 2.26$ ),  $t(189) = 3.60$ ,  $p < .001$ . Lastly, all participants demonstrated at least 20/30 corrected visual acuity assessed by a standard Snellen eye chart.

### **Design**

The design was a 2 x 2 x 3 factorial with participant age (young, old), target characters' age (young, old), and group (control, grandparent, memory aging) as between-group factors. Sixteen participants were tested in each between-groups condition. Following is an overview of the experimental procedures. Details regarding the various measures and materials are described more fully later in this section.

### **Procedure**

Participants were assigned to one of three conditions: control, grandparent seminar, or memory aging seminar. Participants were tested in small groups consisting of 1-4 persons. Two

Table 2: Demographic and Health Characteristics

Variable	Younger Adults		Older Adults	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	20.04	1.60	72.36	5.54***
Educational Level <sup>a</sup>	5.40	1.06	5.70	0.90*
Occupational Level <sup>b</sup>	3.88	1.21	4.20	1.01
Health at present time <sup>c</sup>	1.80	0.85	2.07	0.80**
Health prevents activities <sup>d</sup>	1.53	0.85	1.90	0.99**
Health compared to others <sup>e</sup>	2.69	0.90	1.83	0.94***
Vocabulary	12.61	3.31	19.73	5.54***
Depression <sup>f</sup>	2.26	2.77	1.09	1.52***

*Note.* Education level and occupational level for young adults reflects the educational attainment and professional status of same-sex parents. <sup>a</sup>Educational level (1 = less than 7<sup>th</sup> grade, 2 = 7<sup>th</sup> to 9<sup>th</sup> grade, 3 = 10<sup>th</sup> to 11<sup>th</sup> grade, 4 = high school degree, 5 = partial college or specialized training, 6 = college degree, 7 = graduate degree). <sup>b</sup>Occupational level (1 = unskilled, 2 = semi-skilled, 3 = skilled, 4 = semi-professional, 5 = professional). <sup>c</sup>Health at present time on a 5-point scale (1 = excellent; 5 = poor). <sup>d</sup>Health prevents activities (1 = not at all; 5 = very much). <sup>e</sup>Health compared to others (1 = better; 5 = worse). <sup>f</sup>Scores of 6-10 suggest mild levels of depression. \*  $p = .04$ . \*\*  $p = .02$ . \*\*\*  $p < .01$ .

testing sessions were administered. In the first session, participants completed the demographic questionnaire, the vocabulary test, the GDS, and the KMAQ (Cherry, West, et al., 2000).

Following these questionnaires, control group participants were dismissed for the day.

Participants assigned to the grandparent seminar group watched an educational video designed to increase knowledge of the grandparent-grandchild relationship; participants assigned to the memory aging seminar group watched an educational video designed to increase knowledge and understanding of age-related changes in normative memory functioning in later adulthood.

Lastly, participants completed a 10-item quiz on the material presented in the video.

The second experimental session was administered one week later. During the second session participants completed the vignette-rating task, which required participants to evaluate eight forgetful fictitious persons (i.e., *targets*) described in vignettes (see Appendix A) along 9 dimensions: six causal attribution scales and three memory opinion scales. Participants were given two practice vignettes to familiarize them with the rating scales, followed by the remaining six vignettes. All vignettes were read aloud by the experimenter, and as each vignette was read a slide containing a photograph of the fictitious target was displayed on a screen. The target's name and age introduced each new vignette (e.g., *This is a picture of Bill. Bill is a 76-year-old man who...*). Vignettes were presented in two sequences (e.g., Order 1, Order 2) and presentation order was counterbalanced so that each sequence appeared an equal number of times across participants and across groups. Participants were instructed to complete the rating scales at their own pace, and it was stressed to the participants that their opinions were the primary concern of the study. Next, participants were shown the pictures a second time and asked to verify the age of the target person depicted in each picture. This task was followed by the second administration of the KMAQ, and the MFQ (Gilewski et al., 1990). Participants then completed a post-experimental questionnaire asking about their thoughts on the purpose of the experiment. Lastly, participants in the grandparent and memory aging seminar groups completed an alternative version of the seminar quiz, and the debriefing followed.

## **Measures**

### Causal Attribution Ratings

Following Erber et al. (1990a), participants rated the likelihood of six possible reasons for the forgetting described in each vignette (see Appendix A). These attributions included: (a) poor memory ability, (b) lack of effort, (c) difficulty remembering that type of thing (i.e., task

difficulty), (d) bad luck, and two attention attributions: (e) other things that might have been going on around the central character (external distraction), and (f) all the other things on the central character's mind (internal distraction). Attribution ratings were made using separate 7-point Likert scales, where 1 = *not at all a cause* and 7 = *very much a cause*.

### Memory Opinion Ratings

Following Erber et al. (1990a), participants also completed three memory opinion scales (see Appendix A): (a) how much do you think the central character's forgetting is a sign of mental difficulty (1 = *no indication of mental difficulty*; 7 = *without a doubt a sign of mental difficulty*), (b) how much do you think the central character should seek memory training techniques to improve his/her memory (1 = *definite need for memory training*; 7 = *no need for memory training*), and (c) at what point do you think evaluation should be recommended to determine whether the central character's forgetting was caused by medical and/or psychological problems (1 = *I see no need for evaluation no matter how often it happens*; 2 = *If it happens several times a day*; 3 = *If it happens once a day*; 4 = *If it happens several times a week*; 5 = *If it happens once a week*; 6 = *If it happens once a month*; 7 = *I recommend evaluation the first time it happens*). Higher ratings on the memory opinion scales suggest a poorer opinion of the target persons' memory.

### Memory Knowledge

To measure gains in memory-aging knowledge, participants completed the KMAQ (Cherry, West, et al., 2000) at both pretest and posttest. The KMAQ contains 28 true-false items; half of the items pertain to normal memory changes that occur in later adulthood, and the remaining items pertain to pathological memory deficits due to nonnormative factors affecting memory functioning in older adults (e.g., adult dementia). Following the scoring procedures of

Cherry et al. (2003), KMAQ proportion correct scores were calculated for each participant for each question type. That is, normal memory aging proportion correct scores were calculated by dividing the number correct (normal items) by the total (14) minus the number of “don’t know” responses to normal items. Pathological memory aging proportion correct scores were calculated by dividing the number correct (pathological items) by the total (14) minus the number of “don’t know” responses to pathological memory aging items. For participants in the memory aging group, proportion correct scores on the normal KMAQ items were expected to increase as a result of viewing the memory aging video. No such increase was expected for participants in the control or grandparent groups or for knowledge of pathological memory aging.

A 2 (Participant Age) x 3 (Group) x 2 (Question Type) x 2 (Time of Test) mixed ANOVA on the KMAQ proportion correct scores revealed significant main effects of participant age,  $F(1, 186) = 21.32$ ,  $MS_e = .69$ ,  $p < .001$ , question type,  $F(1, 186) = 34.23$ ,  $MS_e = .60$ ,  $p < .001$ , and time of test,  $F(1, 186) = 12.29$ ,  $MS_e = .14$ ,  $p = .001$ . Means are reported in Table 3. The main effect of group was not significant. Consistent with previous studies (e.g., Cherry, West, et al., 2003; Reese et al., 2000), older adults ( $M = .77$ ) scored better than younger adults ( $M = .71$ ), fewer normal memory aging items ( $M = .71$ ) were answered correctly than pathological memory aging items ( $M = .77$ ), and, posttest performance on the KMAQ ( $M = .75$ ) was better than pretest performance on the KMAQ ( $M = .72$ ).

The interpretation of these effects was qualified by three significant two-way interactions and one significant three-way interaction. First, the Participant Age x Question Type interaction was significant,  $F(1, 186) = 27.79$ ,  $MS_e = .48$ ,  $p < .001$ . Follow-up ANOVAs revealed no significant differences between younger and older adults on the normal memory aging KMAQ items ( $p = .56$ ), however older adults ( $M = .82$ ) scored significantly higher than younger adults

Table 3: Mean Proportion Correct on Knowledge of Memory Aging Questionnaire

Question Type	Younger Adults				Older Adults			
	Pretest		Posttest		Pretest		Posttest	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Control Group</b>								
Normal	.73	0.09	.70	0.13	.68	0.18	.73	0.11
Pathological	.71	0.16	.74	0.11	.77	0.16	.82	0.13
<b>Grandparent Group</b>								
Normal	.68	0.14	.66	0.16	.68	0.18	.73	0.11
Pathological	.72	0.11	.70	0.14	.84	0.14	.85	0.10
<b>Memory Aging Group</b>								
Normal	.67	0.15	.79	0.13	.70	0.15	.77	0.10
Pathological	.70	0.11	.71	0.09	.82	0.10	.82	0.09

( $M = .71$ ) on pathological memory aging items,  $F(1, 191) = 51.25$ ,  $MS_e = .58$ ,  $p < .001$ . Second, the Time of Testing x Question Type interaction was significant,  $F(1, 186) = 5.23$ ,  $MS_e = .04$ ,  $p = .02$ . Paired  $t$ -tests revealed a significant pre- to posttest improvement for normal memory aging items ( $M_{pre} = .69$  vs.  $M_{post} = .76$ ),  $t(191) = -3.64$ ,  $p < .001$ , but not for pathological memory aging items ( $M_{pre} = .73$  vs.  $M_{post} = .77$ ,  $p = .17$ ). Third, there was a significant Group x Question Type interaction,  $F(2, 186) = 3.47$ ,  $MS_e = .06$ ,  $p = .03$ . Paired  $t$ -tests showed significant differences between normal and pathological memory aging items for participants in the control group ( $M_{norm} = .71$  vs.  $M_{path} = .76$ ),  $t(63) = -3.22$ ,  $p = .002$ , and grandparent seminar group ( $M_{norm} = .69$  vs.  $M_{path} = .78$ ),  $t(63) = -4.58$ ,  $p < .001$ . There was no significant difference between normal and

pathological items for participants in the memory aging seminar group ( $M_{\text{norm}} = .73$  vs.  $M_{\text{path}} = .76$ ,  $p = .12$ ). Lastly, as shown in Figure 1 there was a significant Group x Time of Testing x Question Type interaction,  $F(2, 186) = 6.02$ ,  $MS_e = .05$ ,  $p = .003$ . Using a Bonferroni corrected alpha = .008, separate paired sample  $t$ -tests were conducted on proportion correct normal and pathological scores from pretest to posttest for each group. Only one significant difference was revealed: participants in the memory aging seminar group showed a significant pre- to posttest improvement on normal memory aging items ( $M_{\text{pre}} = .69$  vs.  $M_{\text{post}} = .78$ ),  $t(63) = -4.44$ ,  $p < .001$ . Participants in the control and grandparent groups did not show significant improve on normal KMAQ items at posttest and none of the groups significantly improved at posttest on pathological KMAQ items.

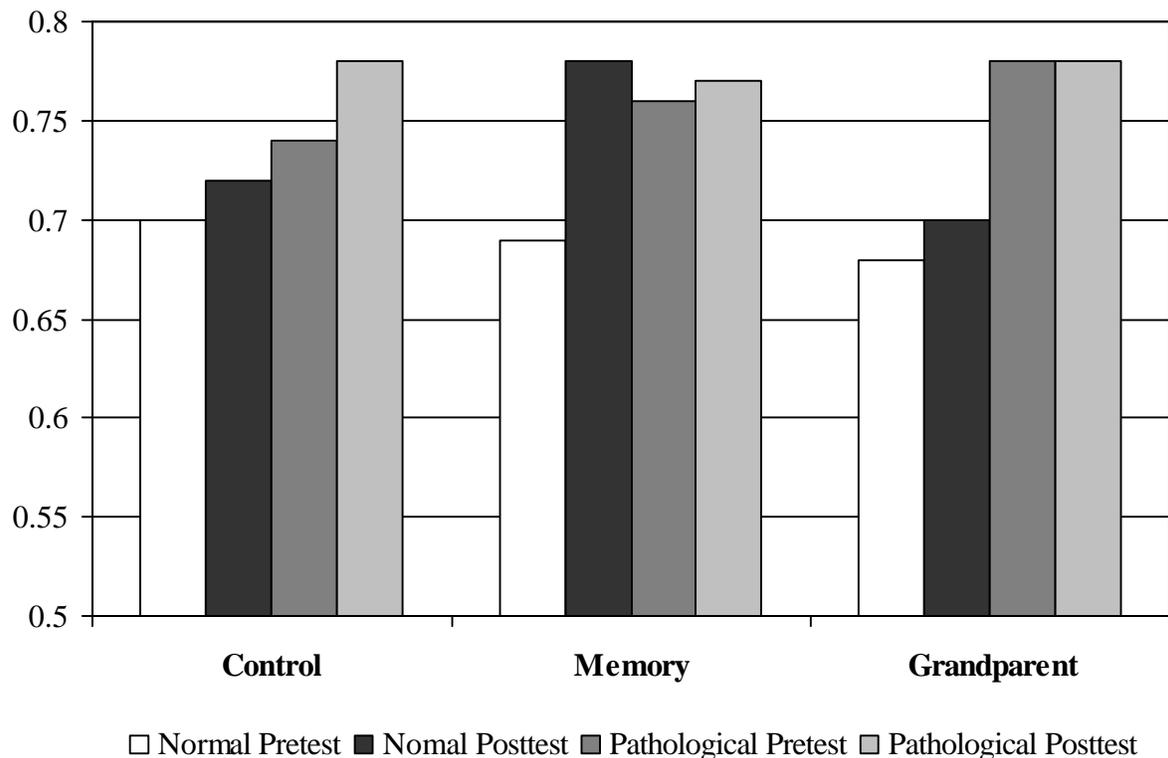


Figure 1: Mean Proportion Correct on KMAQ by Group, Question Type, and Time of Testing

To assess pre- to posttest improvement on KMAQ normal memory aging items addressed specifically in the memory aging video, a 2 (Time) x 2 (Item: covered vs. not covered) repeated measures ANOVA was conducted on proportion correct scores for participants in the memory aging group. A main effect of time of testing,  $F(1, 63) = 23.35, MS_e = .70, p < .001$ , and item,  $F(1, 63) = 14.48, MS_e = .50, p < .001$ , was found. The Time x Item interaction was not significant ( $p = .07$ ). As shown in Figure 2, posttest performance (.78) was significantly greater than pretest performance (.68) on both items covered in the seminar as well as items not covered. Proportion correct was higher for items not covered in the seminar (.76) than for items covered in the seminar (.69), most likely because only items that were not well-known to participants were selected for inclusion in the seminar (discussed more fully later in this section).

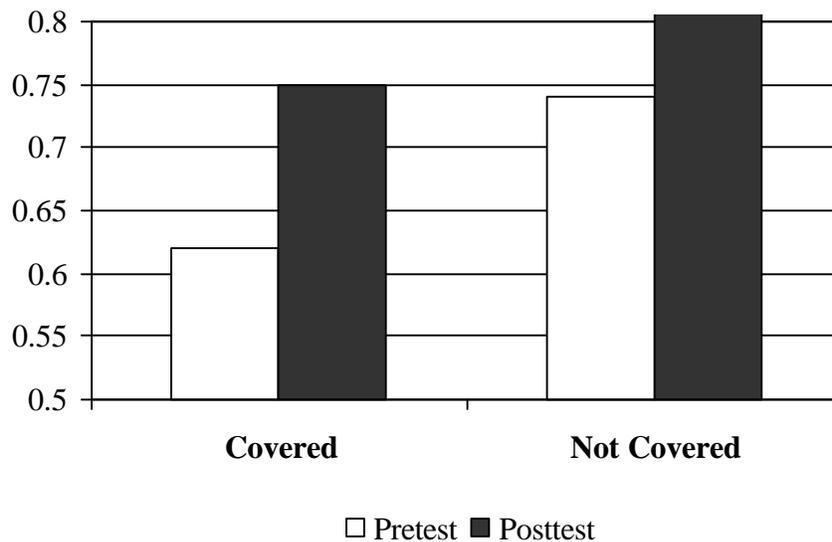


Figure 2: Mean Proportion Correct for KMAQ Items Covered vs. Not Covered in the Memory Aging Seminar

It is possible that “don’t know” responses could be more frequent in covered versus not covered KMAQ items. To explore this possibility a 2 (Time) x 2 (Item) repeated measures ANOVA was conducted on the number of items answered correctly (as opposed to proportion

correct scores which accounts for “don’t know” responses). Results were similar to analyses on proportion correct scores. That is, the main effect of time,  $F(1, 63) = 57.80$ ,  $MS_e = 86.72$ ,  $p < .001$ , and item,  $F(1, 63) = 20.82$ ,  $MS_e = 20.82$ ,  $p < .001$ , were significant, and the interaction between time and item was not significant ( $p = .07$ ), suggesting that participants were not disproportionately answering “don’t know” to any particular set of items.

The results of the memory knowledge analyses may be summarized as follows. Older adults demonstrated greater knowledge of memory aging compared to younger adults, particularly for pathological memory aging items (see Reese et al., 2000). Overall, participants showed less knowledge of normal memory aging than pathological memory aging, although this is qualified by a significant interaction between group, question type, and time of testing. That is, participants in the memory aging seminar group showed the largest pre- to posttest gains on normal memory aging KMAQ items compared to participants in the control and grandparent groups who showed no pre- to posttest gains on normal memory aging knowledge, suggesting the memory aging video increased knowledge of normal age-related memory changes. As expected, none of the groups showed systematic pre- to posttest improvement on knowledge of pathological memory aging. Additional analyses on the proportion correct scores for participants in the memory aging group revealed that performance improved from pretest to posttest on items covered in the seminar as well as items not covered in the seminar, suggesting a generalized knowledge increase.

### Memory Beliefs

To measure differences in subjective beliefs about memory functioning, participants also completed the MFQ (Gilewski et al., 1990). The MFQ contains 64-items and using 7-point Likert rating scales participants responded to questions about four areas of memory functioning.

First, participants rated the frequency that specific types of forgetting (e.g., names, appointments, frequently used phone numbers, etc.) created a problem for them (1 = *always* and 7 = *never*). Second, participants rated how serious they perceived these same instances of forgetting (1 = *very serious*; 7 = *not serious*). Third, participants evaluated their current memory functioning in comparison to memory functioning in the past (e.g., 1 year ago, 5 years ago, 10 years ago, 20 years ago; 1 = *much worse*; 4 = *same*; 7 = *much better*). Lastly, participants rated how frequently they used various mnemonic strategies (e.g., keeping an appointment book, making lists, etc.; 1 = *always*; 7 = *never*). Higher scores on the MFQ reflect higher levels of perceived memory functioning (i.e., less forgetfulness, less serious perceptions of the forgetting, improvement in [or maintenance of] memory ability compared to earlier in life, and less use of mnemonics). Group differences in the MFQ would suggest that the memory aging seminar influenced self-perceived memory functioning.

The MFQ was scored by calculating the mean ratings on each of the four MFQ factors: frequency of forgetting, seriousness of forgetting, retrospective functioning, and mnemonic usage.<sup>5</sup> A 2 (Participant Age) x 3 (Group) x 4 (MFQ Subscale) mixed ANOVA was conducted on mean MFQ ratings. Contrary to expectations, the main effect of group was not significant ( $p = .57$ ). The main effects of participant age,  $F(1, 177) = 9.38$ ,  $MS_e = 10.80$ ,  $p = .003$ , and subscale,  $F(3, 531) = 272.36$ ,  $MS_e = 211.84$ ,  $p < .001$ , were significant. As shown in Table 4, mean ratings were highest for the frequency of forgetting subscale ( $M = 5.19$ ), followed by seriousness of forgetting ( $M = 4.43$ ), retrospective functioning ( $M = 3.95$ ), and mnemonics usage ( $M = 2.63$ ), which were all significantly different from one another. In addition, younger adults' means ratings ( $M = 4.17$ ) exceeded those of older adults ( $M = 3.93$ ). The interpretation of these

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<sup>5</sup>Because younger adults in this study ranged in age from 18 to 26, their scores to the retrospective functioning subscale were calculated omitting responses to the question, "How is your memory compared to the way it was 20 years ago?"

Table 4: Means Ratings on the Memory Functioning Questionnaire

Subscale	Participant Age			
	Younger Adults		Older Adults	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Control Group</b>				
Frequency of Forgetting	5.28	0.66	5.14	0.67
Seriousness of Forgetting	4.29	0.78	4.58	1.10
Retrospective Functioning	4.40	0.82	3.48	0.90
Mnemonics Usage	2.93	1.14	2.76	1.04
<b>Grandparent Group</b>				
Frequency of Forgetting	5.38	0.70	5.05	0.69
Seriousness of Forgetting	4.31	0.92	4.54	1.18
Retrospective Functioning	4.48	0.73	3.36	1.02
Mnemonics Usage	2.56	1.06	2.55	0.98
<b>Memory Aging Group</b>				
Frequency of Forgetting	5.22	0.68	5.06	0.55
Seriousness of Forgetting	4.44	1.22	4.44	1.12
Retrospective Functioning	4.54	1.04	3.46	0.84
Mnemonics Usage	2.22	0.95	2.73	1.17

*Note.* Higher scores reflect higher levels of perceived memory functioning (i.e., less forgetfulness, less serious perceptions of the forgetting, improvement in memory ability compared to earlier in life, and less use of mnemonics).

effects was qualified by a significant Participant Age x Subscale interaction,  $F(3, 531) = 18.30$ ,  $MS_e = 14.23$ ,  $p < .001$ . Using a Bonferroni corrected alpha = .013, separate ANOVAs were conducted on each subscale. No significant differences were found between younger and older adults on the frequency of forgetting ( $p = .03$ ), seriousness of forgetting ( $p = .27$ ), and mnemonics usage subscales ( $p = .48$ ). There was a significant difference in reports of younger and older adults on retrospective memory functioning,  $F(1, 182) = 62.56$ ,  $MS_e = 49.40$ ,  $p < .001$ , replicating Brigman et al. (2000). Younger adults ( $M = 4.46$ ) reported slightly better current memory functioning compared to past memory functioning, whereas older adults ( $M = 3.43$ ) reported slightly worse current memory functioning compared to past memory functioning.

The results of the analyses of memory beliefs suggest that younger and older adults differ in their perceptions of past memory performance in comparison to present memory performance. However, younger and older adults appear to have similar views regarding the frequency and seriousness of current forgetting and they report comparable mnemonics usage, suggesting that that older adults may hold relatively optimistic views of their current memory functioning. Additionally, the memory aging seminar did not appear to influence self-evaluations of memory functioning, contrary to expectations.

## **Materials**

### Overview of Seminars

Participants in the grandparent seminar group watched a film entitled, “The Bond between the Generations” (33:32 running time), and participants in the memory aging seminar group watched a film entitled, “Memory and Aging” (36:47 running time). The author developed, wrote, and performed both lectures presented in the films, and Kevin DiBenedetto from the LSU Centers for Excellence in Learning and Teaching, filmed and edited the lectures.

The basic format of the films included the author standing at a lecture podium in a simulated classroom environment presenting the information directly to the camera. Slides reiterating the main points of the lecture were incorporated into each film. The goal of the films was to mimic a traditional classroom lecture on the respective topics. The films were edited to Digital Video Display (DVD) and participants viewed them on 27” television located approximately 2 feet in front of the table in which they were seated. The primary advantage of the filmed lectures was that they eliminated variability in how information was delivered. A primary advantage of the DVD is that it does not show the normal deterioration associated with repeated viewings of traditional videotape. Thus, the filmed lecture presented on DVD ensured that each participant in the seminar condition received the same information in much the same way.

The content of the films was made as comparable as possible and were similar to lectures one might receive in an introductory developmental psychology course. Details about the contents of the lecture are provided next. A brief content overview of both lectures is provided in Appendix B.

### Grandparent Seminar

The content of the grandparent lecture focused on the unique relationship between grandparents and grandchildren, describing factors that influence emotional closeness between the generations. The goal of the grandparent seminar was to provide a lecture that focused on an “aging” issue, similar to the memory aging lecture, but that which focused on a different area of functioning in adulthood (i.e., social functioning versus cognitive functioning). The style and format of the two seminars were made as comparable as possible, in that every effort was made to include the same number of topics and examples as presented in the memory aging lecture (discussed below).

## Memory Aging Seminar

The content of the memory aging seminar was developed using the Knowledge of Memory Aging Questionnaire (Cherry, West, et al., 2000) as a guide. Seven normal memory aging items from the KMAQ were included in the lecture. These items were selected based on an item analyses from a sample of older adults ( $N = 80$ ) who took the KMAQ as part of another experiment (Cherry et al., 2003). The percentage of people who correctly answered each item was calculated and items were then categorized in descending order from highest to lowest. Of the seven items selected for inclusion in the lecture, three items were answered correctly by 74-90% of the sample and four were answered correctly by 39-64% of the sample. By choosing items in this manner, specific topics could be selected that were not necessarily well-known to participants. Consequently, participants should benefit from instruction on these items (i.e., performance on these items should not be at ceiling). Only older adults' scores on the KMAQ were included in this analysis because studies show that older adults tend to score higher on the KMAQ than younger adults (e.g., Cherry, West, et al., 2003; Reese et al., 2000). Selecting items based on older adults' knowledge of memory aging increases the likelihood that these items are not well-known by this specific age group. Lastly, a subjective criterion was used to select potential items for inclusion in the seminar. That is, items were included that provided for a unitary lecture, which helped to ensure brevity and cohesiveness in the topics covered. For a list of normal memory aging items from the KMAQ included in the seminar see Appendix B.

Previous research suggests that exemplars are important in category learning (e.g., Hayes, Taplin, & Longstaff, 2002). Thus, in addition to focusing on specific items from the KMAQ, specific examples of everyday forgetting were incorporated into the memory aging lecture. These examples were similar to the eight kinds of forgetting used in the vignette-rating task

(vignette development is described more fully in the following section) in that they were based on Herrmann and Neisser's (1978) Inventory of Memory Experiences (IME). The IME asks respondents to rate the frequency of various kinds of everyday forgetting. Based on results from factor analyses, Herrmann and Neisser identified eight separate everyday memory categories: rote, retrieval, place, people, absentmindedness, conversation, names, and errands. IME questions that loaded on each factor were used to develop unique examples of forgetting included in the lecture. Thus, participants were introduced to and provided with examples of everyday forgetting that were similar, but not identical, to the types of forgetting they would be evaluating in the vignette-rating task (see Appendix B).

To summarize, the memory aging lecture included seven normal memory aging items taken directly from the KMAQ and incorporated eight specific examples of everyday forgetting that were similar to the eight types of forgetting depicted in the vignette-rating task. In the introduction of the lecture, the distinction between normative memory changes associated with growing older and pathological memory deficits that are a result of disease was discussed. Additionally, the lecture concluded with the "take home" message that memory is a skill that can be improved with effort and maintained throughout the life course (e.g., Lachman et al.'s, 1992, adaptive view of memory aging).

Several pilot studies were conducted on the seminars to evaluate the content and effectiveness of the lectures as instructional aids. Following is a summary of the pilot studies that were conducted (Table 5 provides a brief overview of purpose and procedures).

#### Seminar Pilot Studies

The seminar pilot studies served several purposes. First, the effectiveness of the seminars as learning tools was evaluated by giving both seminars live to groups of LSU undergraduate

Table 5: Summary of Seminar Pilot Studies

Study	Purpose	Procedures
Pilot 1	Evaluate effectiveness of the live seminars; Quiz development; Compare seminar critiques	1. Pretest A (or B) 2. Seminar (live) 3. Posttest B (or A) 4. Critique
Pilot 2	Evaluate effectiveness of the filmed seminars; Quiz development; Compare seminar critiques; Assess changes in perceptions of older adults	1. Pretest A and B 2. Seminar (film) 3. Posttest A and B 4. Critique

students (Pilot Study 1). Second, the effectiveness of the filmed versions of the seminars as learning tools was evaluated by showing the films to groups of LSU undergraduate students (Pilot Study 2). Additionally, the pilot studies allowed for the development and verification of the usefulness of the *guided notes* (see Appendix C), which was a sheet of paper that included questions that corresponded to the main points addressed in the video, and posttest quizzes that were used in the experiment proper. Finally, the pilot studies provided an opportunity to evaluate participants' subjective impressions of the seminars' content.

Thus, the procedures of the pilot studies were as follows. A 10-item pretest was given at the beginning of the session, followed by the seminar (either live or filmed) during which participants completed the guided notes. Following the seminar, participants completed a 10-item posttest and a critique of the seminar. Following is a summary of the results of each pilot seminar.

Grandparent Pilot Study 1. In the first grandparent pilot study, participants ( $N=32$ ) were presented with the live version of the grandparent seminar. Quiz order was counterbalanced such that one group of participants completed Quiz A at pretest followed by Quiz B at posttest (Order 1); the second group of participants completed Quiz B at pretest and Quiz A at posttest (Order 2). A 2 (Time of Test) x 2 (Order) mixed ANOVA revealed a main effect for time of testing,  $F(1, 30) = 123.65, p < .001$ , in which posttest scores ( $M = 8.91$ ) were significantly higher than pretest scores ( $M = 6.28$ ), and there was no main effect of order ( $p = .21$ ). However, there was a significant interaction between time of testing and order,  $F(1, 30) = 17.94, p < .001$ . Follow-up  $t$ -tests revealed that Order 1 pretest ( $M = 5.56$ ) was significantly lower than Order 2 pretest ( $M = 7.00$ ), suggesting that Quiz A was more difficult than Quiz B. No differences were found comparing Order 1 posttest ( $M = 9.19$ ) to Order 2 posttest ( $M = 8.63$ ). Based on the finding that Quiz A and Quiz B differed at pretest, changes were made to the grandparent quizzes in the second round of piloting in an attempt to make the quizzes comparable in difficulty.

Memory Aging Pilot Study 1. In the first memory aging pilot study, participants ( $N = 28$ ) were presented with the live version of the memory aging seminar following the same procedures as the grandparent pilot study 1. A 2 (Time of Test) x 2 (Order) mixed ANOVA revealed a main effect for time of test,  $F(1, 26) = 22.47, p < .001$ , suggesting that participants scored significantly higher at posttest ( $M = 8.51$ ) than at pretest ( $M = 7.12$ ). The main effect of order was not significant ( $p = .26$ ), and there was no interaction between time of test and order ( $p = .20$ ). Although there was no effect of order and posttest scores were higher than pretest scores, inspection of the means revealed relatively high quiz scores at pretest (e.g.,  $M = 7.12$  on a 10-

point scale). Consequently, changes were made to questions on both quizzes in an attempt to make them more difficult.

Evaluation of Grandparent and Memory Aging Lectures. ANOVAs were conducted on answers given in response to questions from the lecture critique. Participants provided their opinions to three questions using a 7-point Likert scale: (a) Did you find the information presented today *informative*? (b) Did you find the information presented today *interesting*? (c) Did you find the “guided notes” helpful? No differences were found between participant responses in the grandparent and memory aging seminar the seminar group ( $M_{Gp} = 6.22$  vs.  $M_{Mem} = 6.36$ ,  $p = .49$ ;  $M_{Gp} = 5.59$  vs.  $M_{Mem} = 5.54$ ,  $p = .86$ ;  $M_{Gp} = 6.09$  vs.  $M_{Mem} = 6.61$ ,  $p = .06$ , for each question respectively).

Grandparent Pilot Study 2. A second pilot study was conducted on the filmed version of the grandparent lecture. The video was shown to a group of LSU undergraduate students ( $N = 17$ ). Participants were given both versions of the quiz at pretest (Quiz A and Quiz B).<sup>6</sup> Because the testing room was larger than in the experiment proper and to ensure that all participants could adequately see the screen, participants watched the lecture on a 36” television. During the film, participants completed the guided notes. Following the film, participants completed both versions of the quizzes (Quiz A and Quiz B). Lastly, participants completed the seminar evaluation.

A 2 (Quiz Version) x 2 (Time of Test) repeated measures ANOVA revealed a main effect for time of test,  $F(1, 12) = 50.47$ ,  $p < .001$ , suggesting that participants scored significantly higher at posttest ( $M = 9.08$ ) than at pretest ( $M = 6.69$ ). Additionally, the main effect of version was not significant ( $p = .14$ ), and there was no interaction between time of test and version ( $p =$

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<sup>6</sup>Due to experimenter error, the quizzes were not counterbalanced across participants.

.58). An item analysis examining individual questions on each quiz suggested problems with some of the questions (i.e., one question showed that more people answered the item incorrectly following the lecture than prior to the seminar). Consequently, changes were made to the quizzes and given to another group of LSU undergraduate students ( $N = 9$ ) following the same format.

A 2 (Quiz Version) x 2 (Time of Test) repeated measures ANOVA revealed a main effect for time of test,  $F(1, 8) = 23.62, p = .001$ , suggesting that participants scored significantly higher at posttest ( $M = 8.1$ ) than at pretest ( $M = 6.39$ ). Additionally, the main effect of version was not significant ( $p = .15$ ), and there was no interaction between time of test and version ( $p = .11$ ). Based on these results, it was concluded that the filmed version of the grandparent lecture resulted in an increase in knowledge about the grandparent-grandchild relationship as evidenced on pre- to posttest gains on the quizzes. Additionally, it was concluded that Quiz A and Quiz B were equivalent measures of knowledge at pretest and posttest.

Memory Aging Pilot Study 2. Participants in this study watched the filmed version of the memory aging lecture ( $N = 13$ ). Participants were given both versions of the 10-item quiz at pretest and at posttest (Quiz A followed by Quiz B). During the film, they completed the guided notes, and concluded the session by completing the seminar evaluation.

A 2 (Quiz Version) x 2 (Time of Test) repeated measures ANOVA revealed a main effect for time of test,  $F(1, 16) = 68.43, p < .001$ , suggesting that participants scored significantly higher at posttest ( $M = 8.62$ ) than at pretest ( $M = 6.21$ ). Additionally, the main effect of version was significant,  $F(1, 16) = 18.39, p = .001$ , but there was no interaction between time of test and version ( $p = .21$ ). Because of the significant effect of quiz version, follow-up  $t$ -tests were conducted to determine if Quiz A and Quiz B were equivalent at pretest and at posttest. Results

of these analyses showed that participants scored significantly higher on Quiz B at pretest compared to Quiz A at pretest,  $t(16) = -3.73, p = .002$ ; similar results were found at posttest,  $t(16) = -2.87, p = .01$ . The differences between Quiz A and Quiz B may be a result of the fact that the quizzes were not counterbalanced and Quiz A, which was given first, provided helpful cues for answering the questions on Quiz B. Regardless, minor changes were made to the quiz and given to another group of participants.

A group of LSU undergraduate students ( $N = 11$ ) were given the updated version of Quiz A followed by the updated version of Quiz B at pretest as well as posttest. A 2 (Quiz Version)  $\times$  2 (Time of Test) repeated measures ANOVA revealed a main effect for time of test,  $F(1, 10) = 19.80, p = .001$ , suggesting that participants scored significantly higher at posttest ( $M = 8.00$ ) than at pretest ( $M = 6.05$ ). Additionally, the main effect of version was not significant ( $p = .55$ ), and there was no interaction between time of test and version ( $p = .33$ ). From these results, it was concluded that the filmed version of the seminar resulted in an increase in knowledge about age-related memory changes as evidenced on pre- to posttest gains on the quizzes. Additionally, it was concluded that Quiz A and Quiz B were equivalent measures of knowledge at pretest and posttest.

Evaluation of Grandparent and Memory Aging Videos. Lastly, analyses were conducted to examine if participants evaluated the two content areas differently. In addition to the three evaluation questions mentioned previously, following the film participants also rated the overall quality of the video using a 7-point Likert rating scale. To determine participants' perceptions about the information presented in the film, three additional questions were asked. First, participants rated how positive or negative the information was regarding older adults (1 = *mostly negative*; 4 = *neither positive nor negative*; 7 = *mostly positive*). Second, they rated the

degree to which the information presented in the video changed how they think about older adults (1 = *not at all*; 7 = *very much*). Third, they were asked to characterize how their perceptions about older adults had changed after viewing the video (1 = *I view older adults more negatively*; 4 = *no change in how I view older adults*; 7 = *I view older adults more positively*).

Separate ANOVAs were conducted on each evaluation question comparing responses of participants who watched the grandparent lecture to those who watched the memory aging lecture. Results are presented in Table 6. The groups differed in perceptions on only two questions. First, although both groups rated the films fairly high, participants in the memory aging seminar group rated this film as more informative than the grandparent film,  $F(1, 49) = 6.05, p = .02$ . Second, participants who watched the memory aging lecture reported a greater change in how they think about older adults compared to participants who watched the grandparent lecture,  $F(1, 49) = 4.00, p = .05$ . This result is noteworthy in that the memory aging lecture is believed to present information that is inconsistent with most peoples' perceptions of cognitive aging. Both groups agreed that the information presented about older adults in the films was mostly positive and that the change in perceptions was mostly positive.

### Vignettes

The eight vignettes (see Appendix A) used in this study were modified from Erber et al. (1990a). Each vignette described a target person experiencing a single instance of forgetting that matched one of Herrmann and Neisser's (1978) eight factors of everyday forgetting (e.g., rote, absentminded, names, people, conversation, errands, retrieval, and place). The original Erber et al. (1990a) vignettes were obtained from the author and updated for inclusion in the current study. Any outdated scenarios were revised (e.g., reference to a stay-at-home-wife was omitted) and the vignettes were made comparable in terms of word count ( $M = 131.38$  words, range 113-

Table 6: Results of the Seminar Evaluation Questions following the Films

Question	Seminar			
	Memory Aging		Grandparent	
	(n = 28)		(n = 22)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Did you find the information presented today informative?	6.50	0.64	5.86	1.17*
2. Did you find the information presented today interesting?	5.64	1.39	4.86	1.42
3. Did you find the “guided notes” helpful?	6.42	1.03	6.50	0.96
4. How would you rate the overall quality of the video?	5.96	0.92	6.05	0.90
5. How would you rate the information presented today about older adults?	5.86	1.04	6.09	0.97
6. Did the information presented today change how you think about older adults?	4.68	1.96	3.68	1.43*
7. How would you characterize your perceptions of older adults after viewing this lesson?	5.54	1.07	5.36	0.85

\*  $p < .05$ .

142) and reading level ( $M = 8.84$  reading level, as calculated by Microsoft Word, range 7.8-10.3). To control for a possible gender-based attribution bias, the vignettes were changed such that half described a male target and half described a female target (all the targets were female in the original vignettes). Lastly, because previous work has shown that the consequences of the forgetting are indeed important when evaluating forgetfulness in others (e.g., Cherry, Brigman, et al., 2000) a final sentence was added to each vignette suggesting that the forgetting was only temporary, thereby reducing the likelihood that consequences of the forgetting would influence the attribution and memory opinion evaluations. Additionally, this modification would provide a more conservative test of Erber et al.'s (1990a) age-based attribution bias.

In three rounds of pilot testing ( $N = 55$ ), LSU undergraduates read and evaluated several aspects of the vignettes. First, they evaluated what was forgotten in terms of: (a) how typical or common the forgetting was perceived (using a 7-point Likert scale), (b) if the forgetting was more likely to happen to younger adults (20 - 30-year-olds), older adults (60 - 70-year olds), or both, and (c) if the forgetting was more likely to happen to males, females, or both. Second, the outcome of the forgetting was evaluated in terms of: (a) how typical or common (using a 7-point Likert scale) and (b) if the outcome was more likely to happen to younger adults (20 - 30-year-olds), older adults (60-70-year olds), or both. Lastly, participants evaluated the perceived consequences of the forgetting in terms of: (a) presence (yes or no), and if consequences were perceived (b) the seriousness of the consequence (using a 7-point Likert scale). Based on the results of each round of piloting, changes were made to the vignettes. Pilot testing was concluded when the forgetting described in the vignettes received high typicality ratings and was perceived by the majority of participants as equally likely to happen to both younger and older adults, to both males and females, and there to be no or only minor consequences as a result of

the forgetting. Despite repeated modifications, the majority of participants continued to perceive consequences following the forgetting in two vignettes. Although these consequences were rated as relatively minor, it was decided to use these two vignettes as practice.

Next, the vignettes were tested in the context of the experimental design. That is, LSU ( $N = 27$ ) undergraduate research volunteers were tested in the control condition of the experiment proper following the procedures briefly outlined in this section. On the first day of testing, participants completed the KMAQ and MFQ to assess pretest knowledge of memory aging and perceived memory functioning. One week later, participants were presented with the eight vignettes described above. Half of the participants read about younger forgetful persons (in their 20-30's); the other half read about older forgetful persons (60-70's). After reading each vignette, participants completed the causal attribution and memory opinion scales. Then, the KMAQ and MFQ were administered a second time to assess changes in memory aging knowledge and perceived memory functioning.

While participants read the vignettes, a projector displayed a slide containing a photograph of the fictitious target person on a screen. The purpose of the photographs was to ensure that age of the target was salient to research participants. The photographs were identical to those used in Cherry, Brigman, et al. (2000), which, to ensure anonymity of the person in the photograph, were taken from a church directory from a different city and state. Pilot work conducted by Cherry et al. confirmed approximate age of the individuals depicted in the photographs. Additionally, all photographs were rated similarly in terms of perceived attractiveness, amount of social activity, degree of forgetfulness, level of independence/self-sufficiency, and degree of physical/mental disability.

Separate multivariate analyses (MANOVAs) were conducted on the causal attribution evaluations and the memory opinion evaluations, with target age as the between-subject variable and rating scale as the within-subject variable. Contrary to expectations, these results revealed no main effect of target age ( $p = .12$  for the causal attribution scales and  $p = .33$  for the memory opinion scales; means are reported in Table 7). That is, these data did not replicate the findings of Erber et al. (1990a), which found that forgetfulness experienced by younger targets received higher lack of effort ratings and forgetfulness experienced by older targets received higher mental difficulty ratings. Based on these data, the two following modifications were made to the experiment. First, the final sentence of the vignettes, which was included to provide a more conservative test of the age-based attribution bias and to ensure consequences of the forgetting were minimized, was eliminated. Second, it was decided to eliminate the first administration of the MFQ, which was included to assess pre- to posttest changes in perceived memory functioning as a result of the memory aging lecture. It was possible that this measure created demand characteristics that encouraged participants to examine the forgetting described in the vignettes in relation to their own self-perceived memory functioning.

### Manipulation Checks

Several manipulation checks were included in the study. First, during the showing of the films, participants completed the guided notes (see Appendix C). Participants were asked to complete the questions on the guided notes as the topics were introduced in the film. For example, the guided notes asked, “*What are the 3 stages of memory?*”, a topic explicitly covered in the film both verbally and visually with slides, and participants were to write in the blanks provided, “*sensory memory, short-term memory, and long-term memory*”. A post-experimental

Table 7: Means for Causal Attribution and Memory Opinion Scales in Vignette Pilot Study

Rating Scale	Target Age			
	Young		Old	
	<i>(n = 13)</i>		<i>(n = 14)</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Causal-Attribution</b>				
Ability	3.78	0.96	3.19	0.69
Effort	2.21	0.76	1.89	0.72
Task Difficulty	3.90	1.17	3.31	0.95
Luck	1.56	0.85	1.77	1.10
Attention (External)	4.12	1.21	3.49	0.86
Attention (Internal)	4.14	1.42	3.75	1.03
<b>Memory Opinion</b>				
Mental Difficulty	3.31	0.88	2.88	0.86
Need for Training	3.08	1.01	2.44	0.71
Need for Evaluation	2.97	0.93	2.80	0.94

review revealed that all but one older adult research participant correctly completed the majority of questions on the guided notes.

Second, participants viewing the memory aging and grandparent lectures completed two alternative versions of a 10-item quiz to verify they acquired and subsequently retained the information presented in the lectures. Quiz A was given immediately following the lectures in Session 1; Quiz B was given at the conclusion of Session 2. Separate paired sample *t*-tests were

conducted on the quizzes for the memory aging and grandparent groups. The time of testing was significant in the memory aging seminar group,  $t(63) = 2.29, p = .03$ , with participants scoring higher on Quiz A ( $M = 7.53$ ) compared to Quiz B ( $M = 7.05$ ). No differences were found between Quiz A and Quiz B for participants in the grandparent seminar group ( $M_{\text{QuizA}} = 8.00$  vs.  $M_{\text{QuizB}} = 7.77, p = .25$ ).

Third, to ensure that age of the target was salient, following the vignette-rating task participants verified the age of the forgetful target by circling a response that best agreed with their perceptions of the target person's age (1 = 20's-30's, 2 = 40's-50's, 3 = 60's-70's, 4 = 80-90's). The mode and median were calculated for responses to each picture by target age. With the exception of one picture (i.e., young Marjorie), the median and mode for all responses agreed with the assigned age of the target person (i.e., young targets between the ages of 25 and 35 were rated as 1 and old targets between the age of 65 and 75 were rated as 3). The median and mode for young Marjorie was 2, suggesting that she was perceived as 40-50 years of age. Examination of frequency distributions showed that the majority of participants (54.2%) perceived young Marjorie to be in her 40-50s (vs. 44.8% who perceived her to be in her 20-30's). Frequency distributions also revealed a disparity in perceived age of young Dean. That is, 51% perceived young Dean to be in his 20-30s, whereas 49% perceived him to be in his 40-50s. The majority of participants agreed with the ages attributed to the remaining targets pictures.

Lastly, a post-experimental questionnaire was given to assess demand characteristics of the previous week's tasks. These questions were developed following Ericsson and Simon's (1980) guidelines. Answers to these questions were categorized and the percentages of responses by category are reported in Table 8. The first question was a general question about the session the previous week: Did you notice anything special about the session that you

Table 8: Percentage of Responses by Category to Post-Experimental Questionnaire

Participants:	Group					
	Control		Grandparent		Memory Aging	
	Yng	Old	Yng	Old	Yng	Old
<b>Question 1: Did you notice anything special about last week's session?</b>						
No/not really	34.4	12.5	15.6	15.6	21.9	3.1
Other (KMAQ, etc.)	<b>62.5</b>	<b>75.0</b>	<b>34.4</b>	<b>37.5</b>	<b>21.9</b>	<b>50.0</b>
Mentioned memory	3.1	12.5	3.1	6.3	12.5	28.1
Mentioned video	n/a	n/a	31.3	31.3	43.8	18.8
Mentioned grandparenting	n/a	n/a	15.6	9.4	n/a	n/a
<b>Question 2: Did you notice a connection between the two sessions?</b>						
No/not really	18.8	25.0	28.1	<b>68.8</b>	6.3	<b>31.3</b>
Yes, but no explanation	6.3	<b>28.1</b>	6.3	6.3	6.3	18.8
Mentioned KMAQ 2	<b>50.0</b>	<b>28.1</b>	<b>43.8</b>	12.5	<b>46.9</b>	<b>21.9</b>
Mentioned vignettes	6.3	0.0	3.1	0.0	6.3	6.3
Mentioned memory	<b>18.8</b>	<b>18.8</b>	15.6	12.5	<b>34.4</b>	<b>21.9</b>
Mentioned grandparenting	n/a	n/a	3.1	0.0	n/a	n/a
<b>Question 3: Did last week's session influence how you rated the forgetful characters today?</b>						
No/not really	<b>65.6</b>	<b>59.4</b>	<b>84.4</b>	<b>90.6</b>	28.1	21.9
Yes, but no explanation	9.4	31.3	6.3	6.3	12.5	<b>40.6</b>
Mentioned KMAQ	3.1	3.1	3.1	0.0	0.0	3.1
Mentioned memory	21.9	6.3	6.3	3.1	12.5	21.9
Mentioned video	n/a	n/a	0.0	0.0	<b>46.9</b>	12.5
Mentioned grandparenting	n/a	n/a	0.0	0.0	n/a	n/a

attended last week? As seen in Table 8, the majority of participants focused on other aspects of the testing session, such as the KMAQ or the vocabulary test. The second question was more

specific and asked about the perceived link between the two experimental sessions: Did you notice a connection between the two sessions of this study? Overall, participants appeared to focus primarily on the connection between the KMAQ taken during Session 1 and Session 2. For example, one participant responded, “*The use of the same questions...*”; another responded, “*There were repeat questions, but I don’t remember my exact answers*”. Additionally, participants in the control and memory aging seminar groups were more likely to note that both sessions focused on memory. However, older participants in the memory and grandparent seminar groups were more likely to say that they noticed no connection between the sessions.

The third question confirmed the link between the two sessions and asked participants to elaborate on this connection: Do you think that attending last week’s session influenced how you rated the forgetful characters in today’s vignette rating task? The majority of participants in the control and grandparent seminar group stated that they did not think that the previous week’s session influenced how they rated the forgetful targets. The majority of younger participants in the memory aging group specifically mentioned that the video influenced their ratings. However, older participants in the memory aging group were more likely to agree that last week’s session influenced their ratings of the forgetful characters, but they gave either a vague or no explanation as to why.

## RESULTS

### Summary of Scoring Procedures and Analyses

The influence of memory knowledge on perceptions of forgetfulness was analyzed according to the following plan. First, causal attribution and memory opinion ratings were submitted to separate 2 (Target Age) x 2 (Participant Age) x 3 (Treatment Group) x 6 (Vignette) repeated multivariate analyses of variance (MANOVA), using the Wilk's  $\Lambda$  test of significance. Means are reported in Table 9. For MANOVA effects that reached significance at alpha .05, univariates for each dependent measure were conducted and follow-up *t*-tests using Bonferroni corrections were performed. Participants' ratings on each of the nine 7-point Likert scales (causal attribution and memory opinion) for each of the six forgetting vignettes served as the dependent measures. Missing values were replaced with the average rating for that scale using ratings from the remaining vignettes that were answered. Twenty-seven data points (less than .01% of the total data points) for 17 older participants were estimated in this manner. Second, to examine the influence of individual differences in memory knowledge on perceptions of forgetful others, intercorrelations among pretest KMAQ, MFQ, and participants' ratings on the causal attribution and memory opinion scales were evaluated. Only participant data from the control and grandparent seminar group were used in these analyses. Because age differences were noted in the KMAQ and MFQ, partial correlations were computed removing the variance associated with age. Partial correlation coefficients (*r*-values) appear in Table 10.

### Experimental Approach

#### Attribution Evaluations

Contrary to expectations, the MANOVA main effect of group was not significant ( $p = .53$ ,  $\eta^2 = .03$ ,  $1 - \beta = .54$ ) and there were no significant group interactions. There was a

Table 9: Means for Attribution and Memory Opinion Scales

Rating Scale	Control Group							
	Younger Adults				Older Adults			
	Yng Targets		Old Targets		Yng Targets		Old Targets	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Causal-Attribution</b>								
Ability	3.80	0.86	4.06	1.22	3.55	0.71	4.32	1.29
Effort	2.72	0.97	2.42	1.16	3.10	1.41	3.21	1.86
Task Difficulty	3.82	0.95	3.81	0.89	3.93	0.77	4.53	1.12
Luck	1.95	1.23	1.53	0.66	1.92	1.49	1.74	1.40
Attention (External)	4.74	1.12	4.20	1.15	4.32	1.33	4.19	1.30
Attention (Internal)	4.70	1.43	4.40	0.99	4.82	1.18	4.08	1.54
<b>Memory Opinion</b>								
Mental Difficulty	2.77	0.70	3.22	1.26	2.38	0.83	3.71	1.31
Need for Training	2.55	0.51	2.94	1.11	2.93	0.91	3.85	1.41
Need for Evaluation	3.00	1.06	3.00	0.87	2.82	1.09	2.79	0.99
<b>Grandparent Group</b>								
<b>Causal-Attribution</b>								
Ability	3.83	1.31	4.21	1.02	3.15	1.18	4.23	1.56
Effort	2.63	1.00	2.45	1.13	3.04	0.92	2.96	1.30
Task Difficulty	3.81	0.79	3.78	1.04	3.16	0.85	4.23	1.28
Luck	1.84	1.24	1.67	0.92	1.48	0.63	1.34	1.03

Table 9 continued

Rating Scale	Younger Adults				Older Adults			
	Yng Targets		Old Targets		Yng Targets		Old Targets	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Attention (External)	4.38	0.98	4.08	1.29	3.85	1.03	3.77	1.22
Attention (Internal)	4.67	1.03	4.07	1.39	4.08	1.20	4.09	1.25
<b>Memory Opinion</b>								
Mental Difficulty	2.92	1.10	3.57	1.16	2.42	1.09	3.15	1.08
Need for Training	2.66	1.33	3.18	1.08	2.69	1.19	3.14	1.35
Need for Evaluation	2.63	0.91	3.35	0.96	2.53	1.10	3.15	0.93
<b>Memory Aging Group</b>								
<b>Causal-Attribution</b>								
Ability	3.42	1.21	4.05	0.49	3.13	1.14	3.86	1.21
Effort	2.86	0.96	2.44	1.06	3.10	1.24	3.24	1.12
Task Difficulty	3.63	1.10	3.76	1.02	3.56	0.96	3.83	1.34
Luck	2.31	1.46	1.44	1.07	1.84	1.63	1.03	0.13
Attention (External)	4.77	0.92	4.21	1.04	4.39	1.22	3.99	0.95
Attention (Internal)	4.88	0.89	4.17	1.06	4.80	1.39	4.25	0.97
<b>Memory Opinion</b>								
Mental Difficulty	2.70	1.06	3.27	0.64	2.72	1.28	3.06	1.07
Need for Training	3.02	1.42	3.14	1.25	3.61	1.37	3.45	1.28
Need for Evaluation	2.90	0.92	2.97	0.99	3.33	0.85	2.69	1.13

Table 10: Partial correlations among KMAQ, MFQ, and Causal Attribution and Memory Opinion Evaluations

Variable	1	2	3	4	5	6								
1. KMAQ Normal	--													
2. KMAQ Pathological	.35**	--												
3. MFQ Frequency	.08	.07	--											
4. MFQ Seriousness	-.02	.09	.18*	--										
5. MFQ Retrospective	-.03	-.08	.41**	.20*	--									
6. MFQ Mnemonics	.00	-.10	.07	.03	.00	--								
7. Ability	-.11	-.20*	-.18*	-.18*	-.15	-.07	--							
8. Effort	-.17	-.24**	-.12	-.12	.05	.05		--						
9. Task Difficulty	-.10	-.08	-.10	-.07	-.04	.03			--					
10. Luck	-.14	-.03	.06	.01	.03	.02				--				
11. Attention (External)	-.03	-.07	-.09	-.09	.10	.00					--			
12. Attention (Internal)	.00	-.10	-.13	-.15	.06	-.04						--		
13. Mental Difficulty	-.14	-.12	-.24**	-.16	-.11	.03							--	
14. Training	-.05	-.14	-.22*	-.09	-.06	-.01								--
15. Evaluation	.02	.03	-.05	-.13	.05	-.07								

Variable	7	8	9	10	11	12	13	14	15
7. Ability	--								
8. Effort	.19*	--							
9. Task Difficulty	.46**	.35**	--						
10. Luck	-.18*	.17	.17	--					
11. Attention (External)	.05	.30**	.23**	.25**	--				
12. Attention (Internal)	.09	.27**	.26**	.18	.86**	--			
13. Mental Difficulty	.76**	.18*	.48**	-.07	.11	.04	--		
14. Training	.68**	.15	.44**	-.14	.14	.08	.85**	--	
15. Evaluation	.30**	.01	.22*	-.04	.11	.08	.37**	.36**	--

\*  $p \leq .05$ . \*\*  $p \leq .01$ .

significant main effect for participant age,  $F(6, 175) = 5.33, p < .001$ . Of the six univariates, only the effort attribution scale was significant,  $F(1, 180) = 9.02, MS_e = 13.08, p = .003$ .

Replicating Parr and Siegert (1993), older participants gave higher ratings ( $M = 3.11$ ) than did younger participants ( $M = 2.56$ ) to the effort attribution scale, suggesting that older adults were more likely to endorse lack of effort as a cause for memory failures.

There was also a significant main effect for target age,  $F(6, 175) = 6.31, p < .001$ . Five of the univariates were significant: ability, task difficulty, luck, and the two attention scales (external and internal). On the ability attribution scale, memory failures of old targets ( $M = 4.12$ ) were rated higher than young targets ( $M = 3.48$ ),  $F(1, 180) = 15.45, MS_e = 19.90, p < .001$ . Old targets ( $M = 3.99$ ) also received higher ratings than young targets ( $M = 3.65$ ) on the attribution scale of task difficulty,  $F(1, 180) = 5.27, MS_e = 5.53, p = .02$ . In contrast, young targets ( $M = 1.89$ ) were rated higher than old targets ( $M = 1.46$ ) on the attribution scale of bad luck,  $F(1, 180) = 6.74, MS_e = 8.96, p = .01$ . Young targets also received higher ratings on both scales measuring attention. Young targets ( $M = 4.41$ ) received higher ratings than old targets ( $M = 4.07$ ) on the scale attributing memory failures to “other things going on around the central character”,  $F(1, 180) = 4.16, MS_e = 5.39, p = .04$ . To the attribution scale of “other things on the central character’s mind”, young targets ( $M = 4.66$ ) also received higher ratings than old targets ( $M = 4.18$ ),  $F(1, 180) = 7.60, MS_e = 11.10, p = .006$ . These data replicate the age-based double standard found by Erber et al. (1990a; Erber & Rothberg, 1991; Erber et al., 1990b) and are consistent with Deaux’s (1976) expectancy attribution bias.

The main effect for vignette was significant,  $F(30, 151) = 10.72, p < .001$ . The univariates for all six causal attribution rating scales were significant ( $ps < .01$ ). To determine the locus of differences across the six vignettes, pairwise comparisons were performed on each

univariate ( $\eta^2$  values for each attribution scale are reported in Table 11 along with means for each rating scale for each vignette). As shown in Table 11, the people vignette was rated significantly higher ( $M = 4.59$ ) on the ability scale than all the other vignettes, suggesting that participants were more likely to perceive forgetting a name to a familiar face as caused by poor memory ability. The vignettes receiving the lowest ability ratings were the absentmindedness ( $M = 3.71$ ), names ( $M = 3.64$ ), conversation ( $M = 3.40$ ), and rote ( $M = 3.34$ ) vignettes (all of which were not significantly different from one another), suggesting that these types of memory failures (e.g., forgetting what one intended to do in another room, the name of a new acquaintance, what one was about to say in a conversation, and a phone number before dialing) were least likely to be perceived as due to lack of ability.

On the effort scale, the retrieval ( $M = 3.19$ ) and names ( $M = 3.25$ ) vignettes received the highest ratings, suggesting that forgetting the name of a new acquaintance and forgetting a person one met only once before were more likely to be perceived as due to lack of effort. The remaining vignettes received significantly lower ratings on the effort scale. On the task difficulty scale, the rote ( $M = 4.25$ ), retrieval ( $M = 4.19$ ), and names ( $M = 4.14$ ) vignettes received the highest ratings, suggesting that these types of memory failures (e.g., forgetting a person one met only once before, the name of a new acquaintance, and a phone number before dialing) were more likely to be perceived as due to difficulty of the memory task. The absentmindedness ( $M = 3.34$ ) and conversation ( $M = 3.17$ ) vignettes received the lowest task difficulty ratings (and were not significantly different from one another).

On the attribution scale of luck, the names ( $M = 1.81$ ), conversation ( $M = 1.77$ ), and rote ( $M = 1.72$ ) vignettes received the highest ratings, suggesting that these types of memory failures (e.g., forgetting the name of a new acquaintance, what one was about to say in a conversation,

Table 11: Means for Vignettes on Each Rating Scale

Scale	$\eta^2$	Vignette					
		Absentminded	Retrieval	Names	Conversation	People	Rote
Ability	.15	3.71 <sub>c</sub>	4.13 <sub>b</sub>	3.64 <sub>c</sub>	3.40 <sub>c</sub>	4.59 <sub>a</sub>	3.34 <sub>c</sub>
Effort	.07	2.49 <sub>c</sub>	3.19 <sub>ab</sub>	3.25 <sub>a</sub>	2.54 <sub>c</sub>	2.79 <sub>c</sub>	2.82 <sub>bc</sub>
Task Difficulty	.12	3.34 <sub>c</sub>	4.19 <sub>a</sub>	4.14 <sub>ab</sub>	3.17 <sub>c</sub>	3.83 <sub>b</sub>	4.25 <sub>a</sub>
Luck	.02	1.56 <sub>b</sub>	1.60 <sub>b</sub>	1.81 <sub>a</sub>	1.77 <sub>a</sub>	1.56 <sub>b</sub>	1.72 <sub>ab</sub>
Attention (External)	.07	3.92 <sub>bc</sub>	3.81 <sub>d</sub>	4.28 <sub>ab</sub>	4.67 <sub>a</sub>	4.07 <sub>bc</sub>	4.67 <sub>a</sub>
Attention (Internal)	.08	4.72 <sub>a</sub>	4.02 <sub>b</sub>	4.10 <sub>b</sub>	4.67 <sub>a</sub>	4.13 <sub>b</sub>	4.89 <sub>a</sub>
Mental Difficulty	.18	2.93 <sub>c</sub>	3.32 <sub>b</sub>	2.70 <sub>cd</sub>	2.76 <sub>cd</sub>	3.72 <sub>a</sub>	2.52 <sub>d</sub>
Training	.08	3.10 <sub>b</sub>	3.21 <sub>b</sub>	3.04 <sub>b</sub>	2.74 <sub>c</sub>	3.60 <sub>a</sub>	2.88 <sub>bc</sub>
Evaluation	.16	2.74 <sub>bc</sub>	3.31 <sub>a</sub>	2.74 <sub>bc</sub>	2.77 <sub>b</sub>	3.55 <sub>a</sub>	2.47 <sub>c</sub>

*Note.* Means within a given row that differ significantly from one another are noted with subscripts.

and a phone number before dialing) more likely perceived as due to bad luck compared to the other types of forgetting. However, it should also be noted bad luck received the lowest ratings across all the vignettes. In contrast, the two attention (internal and external) attribution scales received the highest overall ratings. Specifically, the rote ( $M = 4.67$ ), conversation ( $M = 4.67$ ) and names ( $M = 4.28$ ) vignettes received the highest ratings on the scale of external attention, suggesting that these types of memory failures (e.g., forgetting a phone number, what one was about to say in a conversation, and the name of a new acquaintance) were perceived as due to external distractions (e.g., “other things going on around the central character”). For the internal attention scale, the rote ( $M = 4.89$ ), absentmindedness ( $M = 4.72$ ), and conversation ( $M = 4.67$ ) vignettes received the highest ratings, suggesting that these types of memory failures (e.g., forgetting a phone number, what one intended to do in another room, and what one was about to say in a conversation) were likely to be perceived as due to internal distractions (e.g., “other things going on in the central character’s mind”). In general, these findings do not replicate the attribution perceptions reported by Erber et al. (1990a) which found very few differences among the various forms of everyday forgetting. However, differences in vignette construction and how participants rated the forgetting may account for these differences. This point is discussed more fully in the Discussion section.

The Vignette x Participant Age interaction was significant,  $F(30, 151) = 2.36, p < .001$ . Four Vignette x Participant Age interaction univariates were significant: ability ( $p < .001$ ), task difficulty ( $p = .004$ ), luck ( $p = .02$ ), and the two measures of attention (external,  $p = .04$ , and internal,  $p = .01$ ). Follow-up  $t$ -tests were conducted on the significant univariates to determine the locus of the interaction. Despite four significant univariates, only two vignettes stood out as different from the others. As shown in Figure 2, younger and older participants differed in

perceptions regarding the causes of forgetfulness on the people vignette (Fig. 2a) and the rote (Fig. 2b) vignette. That is, younger participants ( $M = 5.02$ ) gave significantly higher “lack of ability” ratings than older participants ( $M = 4.17$ ) to the people vignette,  $t(190) = 3.92, p < .001$ , suggesting that younger participants were more likely than older participants to perceive ability as the primary cause of forgetting a name to a familiar face. Younger and older participants did not rate this vignette differently on any of the other causal attribution scales. On the rote vignette, younger participants ( $M = 5.02$ ) gave higher ratings than older participants ( $M = 4.35$ ) to the attribution scale of “other things on the central character’s mind”,  $t(190) = 2.67, p = .008$ , suggesting that younger adults were more likely than older adults to attribute rote types of forgetting to internal distractions. Younger and older participants did not rate this vignette any differently on the other attribution scales. These data suggest differences in how younger and older adults view specific instances of forgetting.

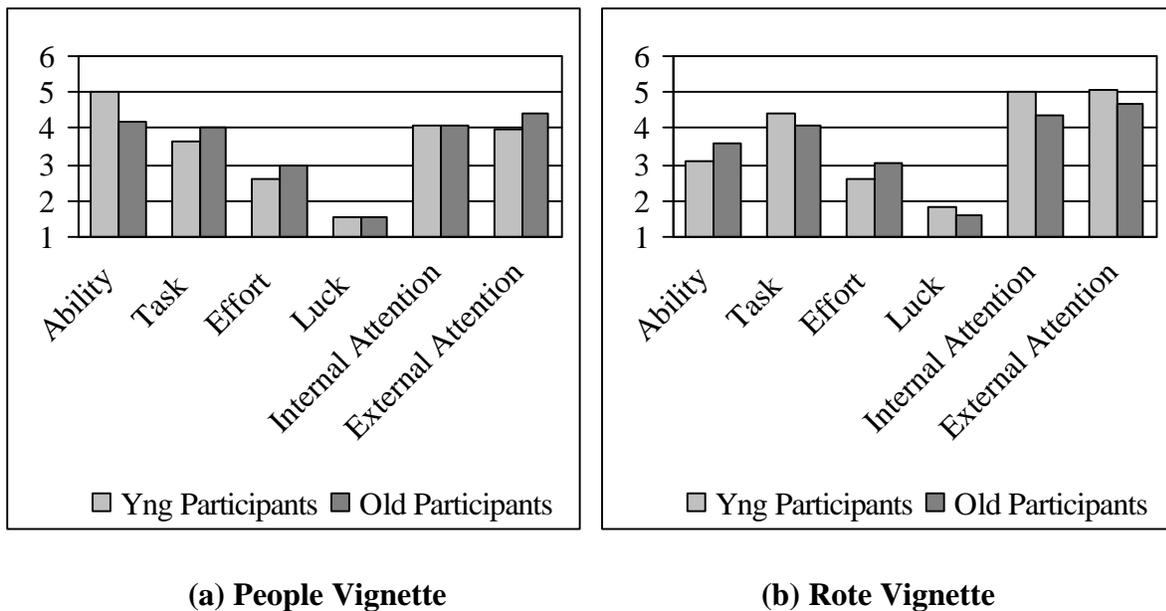


Figure 3: Mean Attribution Ratings for Younger and Older Participants to the People and Rote Vignettes

## Memory Opinion Evaluations

Contrary to expectations, but consistent with outcomes of the causal attribution evaluations, there was no main effect of group ( $p = .10$ ,  $\eta^2 = .03$ ,  $1 - \beta = .68$ ) and there were no significant group interactions on the memory opinion rating scales. There was a significant main effect for participant age,  $F(3, 178) = 6.67$ ,  $p < .001$ . Only one of the three univariates was significant. Older participants gave higher ratings ( $M = 3.28$ ) than did younger participants ( $M = 2.91$ ) on the “need for memory training” scale,  $F(1, 180) = 4.36$ ,  $MS_e = 38.33$ ,  $p = .04$ , suggesting that older adults perceived a higher need for memory training for the forgetful individuals compared to younger adults. These results are in contrast to those reported by Erber et al. (1990a), which found no participant age differences on the rating scale assessing need for memory training. Additionally, Erber et al. found that younger adults were more likely to evaluate the memory failures as an indication of mental difficulty and in need of medical evaluation than older participants. However, these results do replicate Erber and Prager’s (1999) general assertion that older forgetful are more lenient in their perceptions of forgetfulness, a point addressed more fully in the Discussion.

The main effect for target age was significant,  $F(3, 178) = 7.76$ ,  $p < .001$ . Two of the univariates were significant: mental difficulty and memory training. Replicating Erber et al. (1990a), memory failures of older targets ( $M = 3.33$ ) were seen as indicating greater mental difficulty than younger targets ( $M = 2.65$ ),  $F(1, 180) = 19.46$ ,  $MS_e = 133.49$ ,  $p < .001$ , and the recommendation for memory training was significantly higher for older targets ( $M = 3.28$ ) than younger targets ( $M = 2.91$ ),  $F(1, 180) = 4.58$ ,  $MS_e = 40.34$ ,  $p = .03$ .

There was a significant main effect for vignette,  $F(15, 166) = 15.11$ ,  $p < .001$ . All of the univariates were significant ( $ps < .01$ ). Pairwise comparisons were performed on each of the

univariates to determine the locus of the significant difference across the six vignettes on each memory opinion rating scale ( $\eta^2$  values and means for each memory opinion scale are reported in the bottom portion of Table 11). As shown in Table 11, the people vignette was rated significantly higher on the memory opinion scale of mental difficulty ( $M = 3.72$ ) than the other vignettes, suggesting that forgetting a name to a familiar face is more likely to be perceived as a sign of failing mental ability. The names ( $M = 2.70$ ) and rote ( $M = 2.52$ ) received the lowest mental difficulty ratings. Similar to the mental difficulty scale, the people vignette also received the highest ratings ( $M = 3.60$ ) on the memory opinion scale of “need for memory training”. The conversation ( $M = 2.74$ ) and rote ( $M = 2.88$ ) vignettes received the lowest ratings on this scale. For the memory opinion scale of “need for evaluation”, the people ( $M = 3.55$ ) and retrieval ( $M = 3.31$ ) vignettes received the highest ratings, whereas the absentminded ( $M = 2.74$ ), names ( $M = 2.74$ ), and rote ( $M = 2.47$ ) received significantly lower ratings on this scale. Taken together, these data suggest that forgetting a name to a familiar face (i.e., people forgetting) was perceived as the most troubling to participants. These results are consistent with the causal attribution evaluations in which the people vignette received higher lack of ability ratings.

The Vignette x Participant Age interaction was also significant,  $F(15, 166) = 3.30, p < .001$ . All three Vignette x Participant Age interaction univariates reached significance ( $ps = .002$ ). Follow-up  $t$ -tests were conducted on the significant univariates to determine the locus of the interaction. Only two vignettes stood out as different from the others. As shown in Figure 3, younger and older participants differed in perceptions regarding memory opinions on the people vignette (Fig. 3a) and the rote vignettes (Fig. 3b). Younger participants ( $M = 4.03$ ) gave significantly higher “mental difficulty” ratings than older participants ( $M = 3.40$ ) to the people vignette,  $t(190) = 2.84, p = .005$ , suggesting that younger participants were more likely than

older participants to perceive forgetting a name to a familiar face as a sign of mental difficulty. Younger and older adults did not differ in their perceptions on the remaining two memory opinion scales on this vignette. Compared to younger participants ( $M = 2.49$ ), older participants ( $M = 3.26$ ) gave significantly higher “need for memory training” ratings to rote forgetting (e.g., forgetting a phone number before dialing),  $t(190) = -3.47, p = .001$ , and older participants ( $M = 2.71$ ) gave higher ratings on the “need for evaluation” scale compared to younger participants ( $M = 2.24$ ),  $t(190) = -2.79, p = .006$ . Younger and older adults did not differ in perceptions on the mental difficulty scale for this vignette.

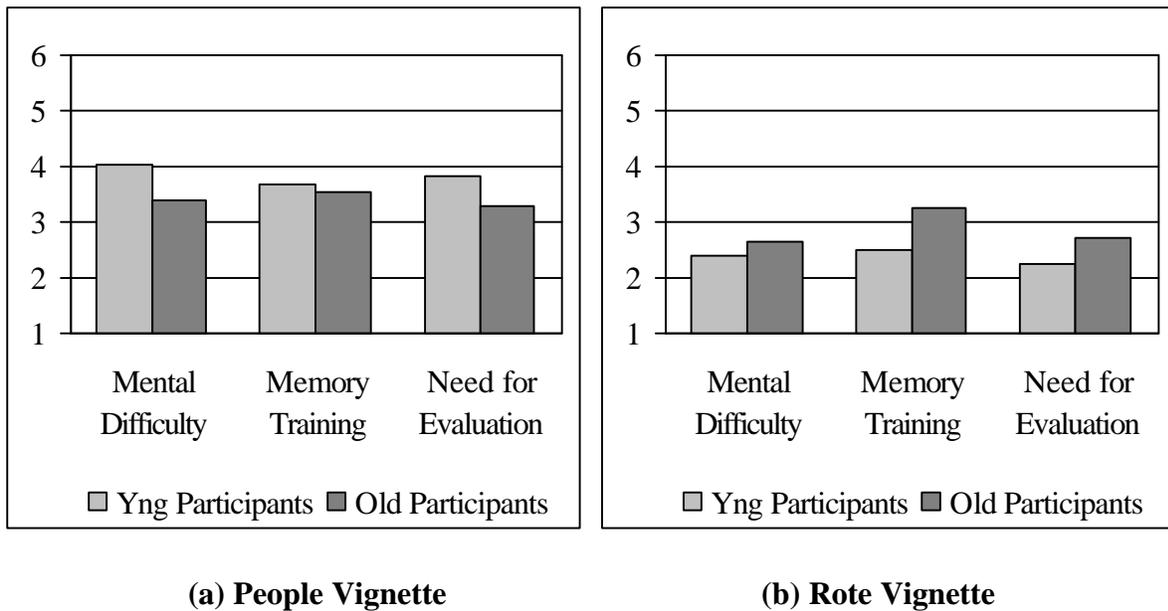


Figure 4: Mean Memory Opinion Ratings for Younger and Older Participants to the People and Rote Vignettes

### Individual Differences Approach

To examine the relationship among memory knowledge and evaluations made of forgetful others, partial correlations were computed removing the variance associated with participant age. It was predicted that if there is a relationship between knowledge of normal age-related memory changes and perceptions of forgetful others, then for participants in the two

control groups pretest normal KMAQ scores would be correlated with ratings on the causal attribution and memory opinion ratings scales. Results of these analyses are discussed next.

#### Knowledge of Memory Aging and Self-perceived Memory Functioning

First, the relationship between memory aging knowledge and self-perceived memory functioning was evaluated. As shown in Table 10, KMAQ normal scores were significantly correlated with KMAQ pathological scores ( $r = .35, p < .001$ ). Examining correlations among the MFQ subscales controlling for age, the frequency of forgetting subscale was significantly correlated with the seriousness of forgetting subscale ( $r = .18, p = .05$ ) and the scale assessing retrospective functioning ( $r = .41, p < .001$ ). The seriousness subscale was also correlated with the retrospective functioning subscale ( $r = .20, p = .03$ ). These data suggest that knowledge of normal and pathological memory aging are correlated with each other. However, knowledge of memory aging is not correlated with self-perceived memory functioning, replicating Brigman et al. (2000).

#### Knowledge of Memory Aging and Perceptions of Forgetfulness

Next, the relationship between memory knowledge and ratings on the causal attribution and memory opinion scales was examined. Contrary to expectations, knowledge of normal memory aging was not significantly correlated with participants' evaluations of targets' memory failures. These results are consistent with the results from the experimental approach outlined above; increasing knowledge of normal memory did not result in group differences in evaluations of forgetful others. As shown in Table 10, an unexpected finding from these analyses was that KMAQ pathological scores were significantly correlated with ratings on the attribution scale of ability ( $r = -.20, p = .03$ ) and the attribution scale of effort ( $r = -.24, p = .009$ ),

suggesting that greater knowledge of pathological memory aging is associated with lower ratings on the ability and effort attribution scales.

#### MFQ and Causal Attribution and Memory Opinion Ratings

Self-perceived memory functioning and ratings on the causal attribution and memory opinion scales were assessed. Referring again to Table 10 (boxed portion), several subscales of the MFQ were correlated with the causal attribution and memory opinion ratings scales. First, the frequency of forgetting subscale and seriousness of forgetting subscale were negatively correlated with the scales of ability ( $r = -.18, p = .05$  and  $r = -.18, p = .05$ , respectively). Second, the frequency of forgetting subscale was significantly correlated with the mental difficulty rating scale ( $r = -.24, p = .009$ ) and memory training rating scale ( $r = -.22, p = .02$ ). Thus, higher scores on select subscales of the MFQ are associated with lower evaluations on three scales: lack of ability, sign of mental difficulty, and need for memory training. These data suggest that, regardless of age of perceiver, a more positive view of one's own memory failures is associated with less harsh evaluations of others' memory failures.

## **DISCUSSION**

The main findings that emerged from the present research can be summarized as follows. First, contrary to expectations, explicit changes in veridical knowledge of normative age-related memory changes were not associated with comparable changes in perceptions of forgetful older adults. Participants in the memory aging group showed the age-based double standard in perceptions of older adults' memory failures despite exhibiting greater knowledge of normative age-associated memory changes. Second, this study replicated previous findings regarding the age-based double standard in perceptions of older adults' memory failures (Erber & Prager, 1999; Erber & Rothberg, 1991; Erber et al., 1990a, 1990b). That is, older fictitious characters experiencing a single instance of forgetting were evaluated more negatively than younger fictitious characters experiencing identical instances of forgetting. Third, consistent with the first finding, individual differences in knowledge of normative age-related memory changes were not related to perceptions of others' forgetfulness. However, perceptions of one's own memory functioning was correlated with evaluations made of other people's memory failures. These findings and their implications are considered in the sections that follow.

### **Changing Knowledge, Not Perceptions**

Replicating previous research (e.g., Reese et al., 2000), participants in the present study answered fewer normal memory aging items correct compared to pathological memory aging items. However, participants' performance on the KMAQ after viewing the educational video addressing normative memory changes associated with later adulthood suggests that declarative knowledge of memory aging is malleable. Younger and older adults in the memory aging group showed significant pre- to posttest performance gains on normal KMAQ memory aging items. Participants in the two control groups did not demonstrate such an increase on normal memory

aging items, and no pre- to posttest group differences were found on the KMAQ pathological memory aging items, suggesting that knowledge of normal memory aging improved as a result of information presented in the memory aging video. Additionally, for participants watching the memory aging video performance gains were noted in both KMAQ items that were specifically addressed in the video and KMAQ items not addressed in the video. Improvements on items covered and not covered suggest that knowledge gained from the video may have transferred to other items on the questionnaire. However, rather than knowledge transfer per se it could be that viewing the video encouraged participants to examine their assumptions about cognitive aging at posttest thereby improving the accuracy of their responses.

Overall, these findings are consistent with previous research which has shown that younger adults' performance on the KMAQ increased as a result of specific instruction (e.g., Cherry et al., 2003, Experiment 2), but this is the first study to demonstrate knowledge gains on the KMAQ for older adults as a result of instruction. Further, this improvement was noted one week following the informational seminar for both younger and older adults, suggesting that gains in memory-aging knowledge were robust. As Hertzog and Hultsch (2000) note, there is little empirical data regarding declarative knowledge about memory knowledge. Results of the present study suggest that although people know less about normal memory aging compared to pathological memory aging, this aspect of metamemory is plastic and receptive to instruction.

Although knowledge of normative cognitive aging improved as a result of instruction, changes in how older forgetful adults were perceived did not follow. Gains in knowledge were observed in the memory aging group, but contrary to expectations, this group did not differ in their evaluations of older forgetful targets. That is, all groups showed the age-based double standard as identified by Erber et al. (1990a, 1990b; see also Erber & Prager, 1999). These

results are reminiscent of findings from the general cognitive literature, which suggests that explicit and implicit processes can operate independently of one another. An independence between controlled (explicit) and automatic (implicit) processes has been shown in social cognitive research. For example, Devine (1989) found that people identified as low on prejudiced beliefs were capable of inhibiting stereotyped-congruent responses on an explicit task requiring them to list their beliefs about a stereotyped racial group compared to people identified as high in prejudiced beliefs. That is, low-prejudiced individuals were able to inhibit responses that were consistent with stereotypes more so than high-prejudiced people. However, both high- and low-prejudiced persons produced stereotype-congruent evaluations when their ability to consciously monitor stereotype activation was prohibited (i.e., when stereotypes were primed implicitly prior to making evaluative judgments of ambiguous behaviors). The present investigation points to a similar independence of explicit knowledge and implicit theories of memory aging in that changes in one (increased declarative memory aging knowledge) do not necessarily lead to changes in the other (attributions of older adults reflected implicit views of cognitive aging).

Results of the correlational analyses provide further evidence of the distinction between explicit knowledge and implicit theories of memory aging. For example, replicating previous research (e.g., Brigman et al. 2000), memory knowledge, as measured by the KMAQ, and self-perceived memory functioning, as measured by the MFQ, were not correlated with one another, suggesting that these two aspects of metamemory (memory knowledge and memory beliefs) are conceptually distinct. This finding is consistent with the cognitive aging literature which has shown memory knowledge and memory beliefs to have a differential relationship with objective memory performance (Hertzog et al., 1990a). In the present investigation, declarative memory

aging knowledge was not correlated with ratings on the attribution or memory opinion scales, but self-perceived memory functioning (i.e., ratings in the MFQ) was. That is, regardless of age of perceiver, more positive perceptions of one's own memory functioning (i.e., less reported frequency of forgetting) was associated with less harsh evaluations of others' everyday kinds of memory failures (i.e., lower ratings on the ability, mental difficulty, and memory training scales). The implications of these findings suggest that personal beliefs about one's own memory functioning may be more important than declarative knowledge of normative age-associated memory changes in evaluating the forgetfulness of others.

Interpretative caution of these data is in order, however. Correlations between the MFQ and evaluation ratings may be spurious and an artifact of demand characteristics inherent in the experimental design. That is, the MFQ was completed after the vignette rating task, and requires participants to rate the frequency of specific instances of forgetting (e.g., forgetting names, faces, phone numbers, etc.). Five of the forgetting episodes depicted in the vignettes were identical to the types of forgetting assessed using the MFQ. Evaluating the forgetful characters in the vignettes *prior* to completing the MFQ may have influenced how participants evaluated their own forgetfulness. Regardless, these findings point to a potential avenue for future research: the relationship between implicit views of one's own forgetting and perceptions of forgetfulness in others.

It is clear from the present study that changing perceptions of older adults is not as simple as increasing one's knowledge about the form and nature of cognitive changes with age. An important question then is: Why are implicit theories of aging so difficult to change? As noted previously, Purdue and Gurtman (1990) found that negative age-related words were activated more readily than positive age-related words, suggesting that negative beliefs about aging are

decidedly entrenched. Greenwald and Banaji (1995) argue that previous experiences, although not specifically remembered, are responsible for implicit stereotyping. And, Montepare and Zebrowitz (2002) note that we (as individuals) have been holding negative views of aging for some time; even children view older adults with generally negative feelings and categorize older adults more negatively than younger adults. Based on these findings, it could be the case that more effortful processing may be required to change perceptions of forgetfulness in older adults. A direction for future research would be to expand the memory aging seminar, incorporating an interactive lecture and “homework” assignments to ensure not only greater gains in memory-aging knowledge, but that this new information is well-grounded. Wilson, Lindsey, and Schooler (2000) argue that as long as people have the capacity to retrieve the explicit attitude from memory, it can be used to automatically override the implicit belief. Greenwald and Banaji (1995) demonstrated that simply making people aware of their implicit attitudes can inhibit their effects in social settings. Thus, adding explicit instructions about the age-based double standard in perceptions of forgetfulness along with the educational program on normal memory changes associated with later adulthood may be helpful in changing evaluations of forgetful older adults.

Although it is not clear why evaluations of others’ forgetfulness did not change as a result of instruction, it is interesting to note that people in the present study *believed* their perceptions had changed. Two findings support this notion. First, in the seminar pilot studies participants viewing the memory aging video were more likely to report that their perceptions of older adults changed as a result of the information presented in the video (see Table 6). Participants who watched the grandparent video were less likely to report such changes. Second, in response to the post-experimental questionnaire, the majority of participants who watched the memory aging video reported that the information presented in the video influenced their evaluations of

forgetful characters (see Table 8). An interesting finding was that this professed influence was not evident on the attribution and memory opinion ratings scales. Thus, although participants believed their views of older adults had changed and influenced how they evaluated forgetfulness in others, the age-based attribution pattern still emerged. In general, these data support the model of dual attitudes as proposed by Wilson et al. (2000), which suggests that people can simultaneously hold an automatic implicit attitude and an explicit attitude toward the same stimulus, and even though attitudes are changed explicitly, the implicit attitude still exists in memory.

It is also interesting to note that there were no group by age differences in self-perceived memory functioning (as measured by the MFQ) as a result of viewing the memory aging video. That is, increases in veridical knowledge of age-related memory changes did not appear to influence how older adults viewed their own memory functioning. This is inconsistent with previous research which suggests that self-perceived memory functioning can be influenced by memory intervention programs (e.g., Caprio-Prevette & Fry, 1996). However, memory intervention studies often focus on participants who express memory complaints (e.g., Turner & Pinkston, 1993; Schmidt et al., 1999). In the present study, this selection criterion was not applied. Additionally, as can be seen in Table 2, the older adults participating in the present study were generally healthy, free of depression, well-educated, of high socioeconomic status (as measured by occupational level), and exhibited excellent vocabulary intelligence. Based on these sample characteristics, it is possible that older volunteers participating in this study already held relatively high evaluations of their own memory functioning, although this question remains unanswerable because pretest self-perceived memory functioning was not assessed. A potential direction for future research would be to examine the effectiveness of the memory aging seminar

on self-perceived memory functioning by assessing self-perceived memory functioning at pretest and at posttest and by including a more heterogeneous group of older adults.

### **Age-Based Double Standard in Perceptions of Forgetfulness**

#### Causal Attributions

Participants' responses to the causal attribution and memory opinion scales revealed that young and old forgetful targets were perceived differently, regardless of older and younger individuals being depicted in identical situations experiencing identical instances of forgetting. Specifically, old forgetful targets in this study received higher ratings on the attribution scales of ability and task difficulty compared to young forgetful targets, who received higher ratings on the attribution scales of luck and attention (external distractions as well as internal distractions). Thus, memory failures of older adults were more likely to be perceived as due to failing memory ability and task difficulty, whereas memory failures of younger adults were perceived as due to bad luck and inattention. These findings replicate the age-based double standard found by Erber et al. (1990a, 1990b, see also Erber & Prager, 1999) and are consistent with Deaux's (1976) expectancy attribution bias in which expected behaviors of a stereotyped group are more likely to be attributed to stable causes, such as ability and task difficulty, and unexpected behaviors are more likely to be attributed to unstable causes, such as effort, luck, and attention. These data suggest that participants may have been using stereotypes, or at least implicit theories about the nature of cognitive aging, to evaluate older adults in stereotype-consistent contexts.

Although the general findings replicate the age-based double standard, it is interesting to note that the present study provides even stronger evidence for Deaux's (1976) expectancy attribution hypothesis compared to previous studies in this area. To briefly review, using everyday forgetting episodes similar to those used in the present study, Erber et al. (1990a) found

that younger adults' forgetfulness was more likely to be attributed to inattention, but they did not find that older adults' forgetfulness was more often attributed to lack of ability. These data partially support Deaux's hypothesis in that unexpected outcomes (i.e., younger adults' memory failures) were attributed to unstable causes (i.e., inattention), but Erber et al. (1990a) did not find that expected outcomes (i.e., older adults' memory failures) were attributed to stable causes (i.e., lack of ability).<sup>7</sup> Using different episodes of forgetting (i.e., short-term, long-term, and very long-term memory failures), Erber et al. (1990b) found that younger adults' forgetting was rated higher in terms of inattention as well as effort (both unstable causes), but again older adults' forgetting was not given higher lack of ability ratings.<sup>8</sup> Using pictures in addition to the vignettes, Erber and Rothberg (1991) found stronger support for Deaux's hypothesis in that older adults' memory failures were more likely to be perceived as due to lack of ability (a stable attribution) compared to younger adults' memory failures, which were more likely to be perceived as due to lack of effort and inattention (both unstable attributions). The present study found that memory failures of older adults were given higher lack of ability *and* task difficulty ratings – both stable attributions – compared to younger adults' memory failures, which were given higher ratings on inattention, an unstable cause of behavior. Thus, the present study provides stronger evidence of Deaux's expectancy attribution bias for stereotyped groups.

Two possible factors could be contributing to the stronger age-based attribution bias found in the present study. First, the slight variation in materials used in the present study versus the materials used in Erber et al. (1990a) may be influencing this finding. For example, although

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<sup>7,8</sup>Results of the memory opinion evaluations in Erber et al. (1990a, 1990b) revealed that participants were more likely to endorse older adults' forgetfulness as an indication of mental difficulty compared to younger adults' forgetfulness. Erber et al. argue that these findings support the notion that older adults' memory failures were attributed to stable characteristics consistent with Deaux's (1976) expectancy attribution bias.

the specific instances of forgetting were similar to the instances of forgetting used in Erber et al. (1990a), all of which were based on Herrmann and Neisser's (1978) everyday factors of forgetting, the scenarios surrounding the forgetting were not identical. The vignettes were updated and modified as detailed in the Methods section. Additionally, in the present experiment the way in which participants were asked to evaluate the forgetful target differed from the original Erber et al. (1990a) experiment. That is, in the present study participants were given six possible reasons for the central character's forgetting, each listed independently, and asked to rate each cause accordingly (see Appendix A). In contrast, Erber et al. (1990a) presented each causal attribution to participants in sentence format. For example, participants were given, "*Do you think that Mrs. X's failure is caused by her poor ability to...?*", followed by the Likert rating scale. Participants were then given the next attribution evaluation in question format (e.g., "*Do you think that Mrs. X's failure to remember...was just a matter of bad luck?*"), and so on. Thus, it is possible that differences in how the forgetting was depicted in the vignettes and how the rating scales were presented to participants may be contributing to the stronger expectancy attribution bias in the present investigation.

Although differences in materials may be attributing to the stronger expectancy attribution bias, a second possibility pertains to the nature of the experimental design. Participants in the present study attended two different experimental sessions, were well aware that the topic under investigation was "memory and aging", and even completed a questionnaire assessing their knowledge of age-related memory changes at pretest. It is possible that these experimental design characteristics may have activated unconscious theories of aging that resulted in a more robust expectancy attribution bias compared to previous studies in this area. There is evidence to suggest that even unconscious attitudes can fluctuate as a function of the

context in which they are elicited (e.g., Mitchell, Nosek, & Banaji, 2003), which may explain why Erber and Rothberg (1991) found stronger evidence of the age-based attribution bias when pictures of older adults were presented in conjunction with the forgetting episodes. Likewise, experimental demand characteristics in the present study may have activated implicit theories of cognitive aging triggering a more robust age-based attribution bias. Future research exploring the role of demand characteristics using this paradigm may shed some insight on how implicit theories are activated in the context of older adults' forgetting.

### Memory Opinions

In terms of memory opinion judgments, the present study found that memory failures of old targets were more likely to be perceived as an indication of mental difficulty compared to memory failures of young targets. These results are consistent with previous studies (Erber et al., 1990a, 1990b) and with the results from the causal attribution evaluations identified above (i.e., older adults' memory failures received higher scores on the attribution scale of ability). Old forgetful targets in this study were also more likely to receive recommendations for memory training compared to young forgetful targets, but no differences were found on the rating scale assessing recommendations for medical or psychological evaluation for the forgetting. These results replicate previous findings (Erber et al. 1990a, 1990b) and are encouraging because they suggest that although older adults' forgetting is more likely to be perceived as a sign of failing mental ability, the memory failures were also perceived as malleable and not serious enough to deserve medical attention (i.e., not necessarily an indication of pathological memory deficits). Thus, participants appear to demonstrate views of memory consistent with Lachman et al.'s (1991) adaptive view of memory: that memory is a skill that can be maintained and improved with effort.

## Participant Age

Overall, both younger and older adults had similar perceptions of forgetful younger and older adults in that both groups of participants demonstrated the age-based double standard when making attribution evaluations. However, there were some differences in absolute ratings between younger and older participants on the specific attribution and memory opinion scales. Specifically, older participants were more likely than younger participants to endorse lack of effort as a cause of memory failures, and older participants were more likely to recommend memory training for memory failures than younger participants. Although these data do not replicate Erber et al.'s (1990a) findings in which older participants gave lower ratings than younger participants on the scales of mental difficulty and medical evaluation and higher ratings on the attribution scale of task difficulty, they do replicate their findings at a conceptual level. Erber and colleagues argue that older participants are more lenient in their evaluations of forgetful others (see Erber & Prager, 1999). The finding that older adults were more likely to perceive lack of effort as a cause of everyday forgetting and that they were more likely to recommend memory training suggests that they endorse a more positive view of memory aging compared to younger adults. As mentioned in the Introduction, this is consistent with previous studies which have found that although older adults hold implicit views of cognitive decline, they also hold more elaborate conceptions about the course of cognitive development throughout the life span compared to younger adults (e.g., Lineweaver & Hertzog, 1998). Additionally, as Cuddy and Fiske (2002) note, people often make distinctions between “us” (i.e. in-group) and “them” (i.e., out-group) to promote positive evaluations of their own group, and consequently themselves. Thus, evaluating the forgetfulness of other older adults more leniently (i.e., more

likely due to lack of effort and modifiable through training) would provide a means of framing one's own forgetting more positively.

### Types of Forgetting

Examining ratings for each of the vignettes suggests that most of the everyday forgetting episodes were attributed to inattention (both internal and external). That is, most vignettes received the highest ratings on the two attribution scales measuring attention. In contrast, bad luck was least likely to be perceived as the cause for everyday kinds of forgetting. These findings are promising because they suggest that participants held realistic views of everyday memory failures – internal and external distractions often explain the majority of forgetting in day-to-day life. As further evidence that participants were applying relatively lenient criteria to the everyday forgetting, note the average ratings to each vignette on the three memory opinion scales (Table 11). For example, the highest average rating ( $M = 3.72$ ) occurred to the “people” vignette on the memory opinion scale of mental difficulty. The end points of the Likert rating scale were 1 = *no indication of mental difficulty* and 7 = *without a doubt a sign of mental difficulty*. Thus, an average rating of 3.72 is slightly less than the mid-point on the Likert scale. Taken together, these data suggest that most of the everyday forgetting episodes (except “people” forgetting, which is discussed next) were not perceived as very serious or troubling to participants.

Only one type of forgetting stood out as markedly different from the remaining forgetting episodes, forgetting a name to a familiar face (i.e., people forgetting). Specifically, forgetting a name to a familiar face was more likely to be perceived as due to lack of ability ( $M = 4.59$ , Table 11). Additionally, compared to the other kinds of forgetting, “people” memory failures received higher ratings on all three memory opinion scales: mental difficulty ( $M = 3.27$ ), need for memory training ( $M = 3.60$ ), and need for medical evaluation ( $M = 3.55$ ). This finding was qualified by a

significant interaction with participant age on the ability and mental difficulty scale. Younger adults were more likely than older adults to evaluate forgetting a familiar face as due to lack of ability and as a sign of mental difficulty, suggesting that younger adults viewed this type of memory failure as more serious than did older adults. In general, Erber et al. (1990a) reported very few differences among the everyday episodes of forgetting. In particular, the people vignette did not stand out on the attribution scale of ability. However, consistent with the present study, Erber et al. (1990a) reported that the people forgetting did receive higher ratings on the memory opinion scale of “mental difficulty.” It is not clear why this study found the people vignette to be more bothersome, but as mentioned previously, differences in how the specific instances of forgetting were perceived by participants could be due to differences in how the vignette scenarios were constructed as well as how judgments were made.

### **Individual Differences in Memory Knowledge**

Contrary to expectations, normal memory aging scores on the KMAQ were not correlated with any of the causal attribution or memory opinion rating scales. However, these results are consistent with the experimental results reported earlier. Declarative knowledge of normative memory aging does not appear to play a role in how older forgetful adults are perceived. Interestingly, knowledge of pathological memory aging was negatively correlated with ratings on the attribution scales of ability and effort. That is, greater knowledge of pathological-memory aging was associated with lower ratings on the ability and effort attribution scales. Intuitively one could argue that the more knowledge a person has about the symptoms and etiology of pathological memory deficits, the less likely they would be to negatively view everyday forgetting episodes like those depicted in this study. Interpretation of these data is tentative because this experiment did not specifically address the relationship between knowledge of

pathological memory aging and perceptions of forgetful others. However, this finding provides one direction for future research. It is possible that placing more emphasis on distinctions between normal and pathological memory aging could influence how forgetfulness in others is perceived.

### **Summary and Conclusions**

Several limitations of the present research warrant brief mention. First, it is possible that because of a small effect size, sample size in the current study may not have been sufficient to detect group differences in attribution and memory opinion judgments. However, this seems unlikely because there was sufficient power to detect a three-way interaction among group, time of test, and question type on the KMAQ scores. Second, although memory knowledge increased for participants viewing the memory aging video, participants' performance improved on average by only 1-2 questions. Thus, it is possible that increases in memory knowledge were not sufficient to influence changes in perceptions of the causal attribution and memory opinion scales. Third, it is unclear how demand characteristics of the study influenced outcomes. That is, knowing the purpose of the experiment may have activated the very implicit theories sought to be changed in the present study. Lastly, as with most cognitive aging research, samples of younger and older adults are primarily samples of convenience. In particular, older adults were well-educated, reported high occupational status, and had good cognitive functioning as measured by scores on the vocabulary assessment. Consequently, it is possible that the younger and older participants in the present study were not representative of the younger and older adult populations as a whole.

Directions for future research point to a more comprehensive exploration of the relationship between declarative knowledge and implicit views of older adults, potentially by

developing a more comprehensive memory training program. For example, Caprio-Prevette and Fry (1993) found that cognitive restructuring techniques, in which participants identified maladaptive beliefs about memory, in addition to an educational component, which focused on educating participants about the various theories of forgetting, how memory works, and Alzheimer's disease and other causes of memory decline, resulted in the most robust changes in self-perceived memory functioning (changes in objective memory performance were also observed). A similar program may be effective in changing perceptions of forgetfulness as well. Future research may also wish to further investigate the relationship between of knowledge pathological memory aging and perceptions of older adults' forgetfulness.

In summary, the impetus for the present investigation was to examine the question: does *lack* of memory aging knowledge account for how older persons are perceived in the context of forgetting? A reasonable assumption is that the knowledge one brings to the context can influence the evaluations made in that context. Based on results of the present study, it appears that "knowledge" in the form of stereotypes about older adults and implicit theories of aging more strongly influence perceptions of older adults than declarative knowledge of age-related memory changes. This study suggests that these two aspects of metamemory are independent of one another and that changes in one (increased declarative memory aging knowledge) do not necessarily lead to changes in the other (attributions of older adults reflected implicit views of cognitive aging). This is an important contribution to the cognitive aging literature because it suggests that implicit theories of aging are not as malleable as explicit knowledge.

## REFERENCES

- Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence (Ed.), *The psychology of learning and motivation: Advances in research and theory: Vol. 2* (pp. 89-195). New York: Academic Press.
- Baltes, P. B., Dittmann-Kohli, F., & Dixon, R. A. (1984). New perspectives on the development of intelligence in adulthood: Toward a dual-process conception and a model of selective optimization with compensation. *Life-span Development and Behavior*, 6, 33-76.
- Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology*, 25, 729-735.
- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: W.H. Freeman and Company.
- Berry, J. M. (1999). Memory self-efficacy in its social cognitive context. In T. M. Hess and F. Blanchard-Fields (Eds.), *Social Cognition and Aging* (pp.70-96). San Diego, CA: Academic Press.
- Blank, T. O. (1982). *A social psychology of developing adults*. New York: John Wiley & Sons, Inc.
- Brigman, S., Cherry, K. E., & Roecke, C. (2000). Knowledge of memory aging: Relationship to self-reported memory ability. Poster session presented at the Southeastern Psychological Association Meeting, New Orleans, LA.
- Caprio-Prevette, M. D., & Fry, P. S. (1996). Memory enhancement program for community-based older adults: Development and evaluation. *Experimental Aging Research*, 22, 281-303.
- Cavanaugh, J. C., & Green, E. (1990). I believe, therefore I can: Self-efficacy beliefs in memory aging. In E. A. Lovelace (Ed.), *Aging and Cognition: Mental processes, Self Awareness and Interventions* (pp. 189-230). North-Holland: Elsevier Science Publishers.
- Cavanaugh, J. C., & Perlmutter, M. (1982). Metamemory: A critical examination. *Child Development*, 53, 11-28.
- Chanowitz, B., & Langer, E. (1981). Premature cognitive commitment. *Journal of Personality and Social Psychology*, 41, 1051-1063.
- Cherry, K. E., & Brigman, S. (2002). Perceptions of forgetfulness in adulthood. Poster session presented at the Cognitive Aging Conference, Atlanta, GA.
- Cherry, K. E., Brigman, S., Burton, A., & Roecke, C. (2000). Perceptions of forgetfulness in adulthood. Poster session presented at the Cognitive Aging Conference, Atlanta, GA.

Cherry, K. E., Brigman, S., Hawley, K. S., & Reese, C. M. (2003). The Knowledge of Memory Aging Questionnaire (KMAQ): Effects of adding a “don’t know” response option. *Educational Gerontology, 29*, 1-23.

Cherry, K. E., & Plauche, M. F. (1996). Memory impairment in Alzheimer's disease: Findings, interventions, and implications. *Journal of Clinical Geropsychology, 2*, 263-296.

Cherry, K. E., & Smith, A. D. (1998). Normal memory aging. In M. Hersen and V.B. Van Hasselt (Eds.), *Handbook of Clinical Geropsychology* (pp. 87-110). New York: Plenum Press.

Cherry, K. E., West, R. L., Reese, C. M., Santa Maria, M. P., & Yassuda, M. (2000). The knowledge of memory aging questionnaire. *Educational Gerontology, 26*, 195-219.

Craik, F. I. M., & Jennings, J. M. (1992). Human memory. In F. I. M. Craik and T. A. Salthouse (Eds.), *The handbook of aging and cognition* (pp. 51-110). Hillsdale, NJ: Lawrence Erlbaum.

Cuddy, A. J. C., & Fiske, S. T. (2002). Doddering but dear: Process, content, and function in stereotyping of older persons. In T. D. Nelson (Ed.), *Ageism: Stereotyping and prejudice against older persons* (pp. 3-26). Cambridge, MA: MIT Press.

Cutler, S. J., & Hodgson, L. G. (1996). Anticipatory dementia: A link between memory appraisals and concerns about development Alzheimer’s disease. *The Gerontologist, 36*, 657-664.

Deaux, K. (1976). Sex: A perspective on the attribution process. In J. F. Harvey, W. J. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research: Vol. 1* (pp. 335-352). Hillsdale, NJ: Erlbaum.

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5-18.

Dixon, R. A. (1989). Questionnaire research on metamemory and aging: Issues of structure and function. In L. W. Poon, D. C. Rubin, & B. A. Wilson (Eds.), *Everyday cognition in adulthood and old age* (pp. 394-415). New York: Cambridge University Press.

Dixon R. A., & Cohen, A. (2003). Cognitive development in adulthood. In R. M. Lerner, M. A. Easterbrooks, & J. Mistry (Eds.), I. B. Weiner (Editor-in-Chief), *Handbook of Psychology: Vol. 6, Developmental Psychology* (601-628). Hoboken, NJ: John Wiley & Sons.

Dixon, R. A., & Hultsch, D. F. (1983). Structure and development of metamemory in adulthood. *Journal of Gerontology, 38*, 682-688.

Duke University Center for the Study of Aging and Human Development (1975). *OARS: Multidimensional Functional Assessment Questionnaire*. Durham, NC: Author.

Dunlosky, J., & Hertzog, C. (1998). Training programs to improve learning in later adulthood: Helping older adults educate themselves. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Metacognition in Educational Theory and Practice* (pp. 249-275). Mahwah, NJ: Lawrence Erlbaum Associates.

Elliott, E., & Lachman, M. E. (1989). Enhancing memory by modifying control beliefs, attributions, and performance goals in the elderly. In P. S. Fry (Ed.), *Psychological Perspectives of Helplessness and Control in the Elderly* (pp. 339-367). North Holland: Elsevier Science Publishers B. V.

Erber, J. T. (1989). Young and older adults' appraisal of memory failures in young and older adult target persons. *Journal of Gerontology: Psychological Sciences*, *44*, P170-175.

Erber, J. T., Etheart, M. E., & Szuchman, L. T. (1992). Age and forgetfulness: Perceivers' impressions of targets' capability. *Psychology and Aging*, *7*, 479-483.

Erber, J. T., & Prager, I. G. (1999). Age and memory: Perceptions of forgetful young and older adults. In T. M. Hess & F. Blanchard-Fields (Eds.), *Social Cognition and Aging* (pp.198-217). San Diego, CA: Academic Press.

Erber, J. T., Prager, I. G., Williams, M., & Caiola, M. A. (1996). Age and forgetfulness: Confidence in ability and attribution for memory failures. *Psychology and Aging*, *11*, 310-315.

Erber, J. T., & Rothberg, S. T. (1991). Here's looking at you: The relative effect of age and attractiveness on judgments about memory failure. *Journal of Gerontology: Psychological Sciences*, *46*, P116-123.

Erber, J. T., Szuchman, L. T., & Rothberg, S. T. (1990a). Everyday memory failure: Age differences in appraisal and attribution. *Psychology and Aging*, *5*, 236-241.

Erber, J. T., Szuchman, L. T., & Rothberg, S. T. (1990b). Age, gender, and individual differences in memory failure appraisal. *Psychology and Aging*, *5*, 600-603.

Ericsson, K. A., & Simon, H. A. (1980). Verbal reports as data. *Psychological Review*, *87*, 215-251.

Flavell, J. H., & Wellman, H. M. (1977). Metamemory. In R. V. Kail and J. W. Hagan (Eds.), *Perspectives on the development of memory and cognition* (pp. 3-33). Hillsdale, NJ: Lawrence Erlbaum Associates.

Floyd, M., & Scogin, F. (1997). Effects of memory training on the subjective memory functioning and mental health of older adults: A meta-analysis. *Psychology and Aging*, *12*, 150-161.

Gardner, E., & Monge, R. (1977). Adult age differences in cognitive abilities and educational background. *Experimental Aging Research*, *15*, 73-78.

Gilewski, M. J., Zelinski, E. M., & Schaie, K. W., (1990). The memory functioning questionnaire for assessment of memory complaints in adulthood and old age. *Psychology and Aging, 5*, 482-490.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 120*, 4-27.

Guo, X., Erber, J. T., & Szuchman, L. T. (1999). Age and forgetfulness: Can stereotypes be modified? *Educational Gerontology, 25*, 457-466.

Hayes, B. K., Taplin, J. E., & Longstaff, M. (2002). Prior knowledge and exemplar similarity in category learning: Further evidence for their integration. *European Journal of Cognitive Psychology, 14*, 549-571.

Heckhausen, J., Dixon, R. A., & Baltes, P. B. (1989). Gains and losses in development throughout adulthood as perceived by different adult age groups. *Developmental Psychology, 25*, 109-121.

Herrmann, D. J., & Neisser, W. (1978). An inventory of everyday memory experiences. In M. M. Gruneberg, P. E. Morris, & R. N. Sykes (Eds.), *Practical aspects of memory* (pp. 35-51). New York: Academic Press.

Hertzog, C., Dixon, R. A., & Hultsch, D. F. (1990a). Metamemory in adulthood: Differentiating knowledge, belief, and behavior. In T. M. Hess (Ed.), *Aging and Cognition: Knowledge, organization, and utilization* (pp. 161-212). North-Holland: Elsevier Science Publisher.

Hertzog, C., Dixon, R. A., & Hultsch, D. F. (1990b). Relationship between metamemory, memory predictions, and memory task performance in adults. *Psychology and Aging, 5*, 215-227.

Hertzog, C., Dixon, R. A., Schulenberg, J. E., & Hultsch, D. F. (1987). On the differentiation of memory beliefs from memory knowledge: The factor structure of the metamemory in adulthood scale. *Experimental Aging Research, 13*, 101-107.

Hertzog, C., & Hultsch, D. F. (2000). Metacognition in adulthood and old age. In F. I. M. Craik & T. A. Salthouse (Eds.), *The Handbook of Aging and Cognition, 2<sup>nd</sup> Ed.* (pp. 417-466). Mahwah, NJ: Lawrence Erlbaum Associates.

Hertzog, C., Hultsch, D. F., & Dixon, R. A. (1989). Evidence for the convergent validity of two self-report metamemory questionnaires. *Developmental Psychology, 25*, 687-700.

Hess, T. M. (1999). Cognitive and knowledge-based influences on social representations. In T. M. Hess & F. Blanchard-Fields (Eds.), *Social Cognition and Aging* (pp. 237-263). San Diego, CA: Academic Press.

Hultsch, D. F., Hertzog, C., & Dixon, R. A. (1987). Age differences in metamemory: Resolving the inconsistencies. *Canadian Journal of Psychology, 41*, 193-208.

Hummert, M. L. (1990). Multiple stereotypes of elderly and young adults: A comparison of structure and evaluations. *Psychology and Aging*, 5, 182-193.

Hummert, M. L. (1999). A social cognitive perspective on age stereotypes. In T. M. Hess & F. Blanchard-Fields (Eds.), *Social Cognition and Aging* (pp. 175-196). San Diego, CA: Academic Press.

Jarvik, L. F. (1980). Diagnosis of dementia in the elderly: A 1980 perspective. *Annual Review of Gerontology and Geriatrics*, 1, 180-203

Kite, M. E., Deaux, K., & Miele, M. (1991). Stereotypes of young and old: Does age outweigh gender? *Psychology and Aging*, 6, 19-27.

Kite, M. E., & Johnson, B. T. (1988). Attitudes toward older and younger adults: A meta-analysis. *Psychology and Aging*, 3, 233-244.

Lachman, M. E., Weaver, S. L., Bandura, M., Elliott, E., & Lewkowicz, C. J. (1992). Improving memory and control beliefs through cognitive restructuring and self-generated strategies. *Journal of Gerontology: Psychological Sciences*, 47, P293-P299.

Lineweaver, T. T., & Hertzog, C. (1998). Adults' efficacy and control beliefs regarding memory and aging: Separating general from personal beliefs. *Aging, Neuropsychology, and Cognition*, 5, 264-269.

Miller, L. M. S., & Lachman, M. E. (1999). The sense of control and cognitive aging. In T. M. Hess and F. Blanchard-Fields (Eds.), *Social Cognition and Aging* (pp.17-41). San Diego, CA: Academic Press.

Mitchell, J. P., Nosek, B. A., & Banaji, M. R. (2003). Contextual variations in implicit evaluation. *Journal of Experiment Psychology: General*, 132, 455-469.

Montepare, J. M., & Zebrowitz, L. A. (2002). A social-developmental view of ageism. In T. D. Nelson (Ed.), *Ageism: Stereotyping and prejudice against older persons* (pp. 77-125). Cambridge, MA: MIT Press.

Parr, W. V., & Siegert, R. (1993). Adults' conceptions of everyday memory failures in others: Factors that mediate the effects of target age. *Psychology and Aging*, 8, 599-605.

Perdue, C. W., & Gurtman, M. B. (1990). Evidence for the automaticity of ageism. *Journal of Experimental Social Psychology*, 26, 199-216.

Perlmutter, M. (1978). What is memory aging the aging of? *Developmental Psychology*, 14, 330-345.

Reese, C. M., Cherry, K. E., & Copeland, A. L. (2000). Knowledge of normal versus pathological memory aging in younger and older adults. *Aging, Neuropsychology, and Cognition*, 7, 1-8.

Reese, C. M., Cherry, K. E., & Norris, L. E. (1999). Practical memory concerns of older adults. *Journal of Clinical Geropsychology, 5*, 231-244.

Reisberg, B., Ferris, S. H., deLeon, M. J., Crook, T., & Haynes, N. (1987). Senile dementia of the Alzheimer's type. In M. Bergener (Ed.), *Psychogeriatrics: An international handbook* (pp. 306-334). New York: Springer Publishing Company.

Salthouse, T. A. (1991). *Theoretical perspectives on cognitive aging*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Schaie, K. W., & Willis, S. (1986). Can decline in adult intellectual functioning be reversed? *Developmental Psychology, 22*, 223-232.

Schmidt, I. W., Zwart, J. F., Berg, I. J., & Deelman, B. G. (1999). Evaluation of an intervention directed at the modification of memory beliefs in older adults. *Educational Gerontology, 25*, 365-385.

Schneider, W., & Pressley, M. (1989). *Memory development between 2 and 20*. New York: Springer-Verlag.

Smith, A. D., & Earles, J. (1996). Memory changes in normal aging. In F. Blanchard-Fields & T. M. Hess (Eds.), *Perspectives on cognitive change in adulthood and aging* (pp. 192-220). New York: McGraw-Hill

Sternberg, R. J. (1987). Implicit theories: An alternative to modeling cognition and its development. In J. Bisanz, C. J. Brainerd, & R. Kail (Eds.), *Formal methods in developmental psychology: Progress in cognitive development research* (pp. 155-192). New York: Springer-Verlag Inc.

Turner, J. L., & Pinkston, R. S. (1993). Effects of a memory and aging workshop on negative beliefs of memory loss in the elderly. *Educational Gerontology, 19*, 359-373.

Vasil, L., & Wass, H. (1993). Portrayal of the elderly in the media: A literature review and implications for educational gerontologists. *Educational Gerontology, 19*, 71-85.

Verhaeghen, P., Marcoen, A., & Goossens, L. (1992). Improving memory performance in the aged through mnemonic training: A meta-analytic study. *Psychology and Aging, 7*, 242-251.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548-573.

Weiner, B., Frieze, I., Kukla, A., Reed, L., Rest, S., & Rosenbaum, R. M. (1971). *Perceiving the causes of success and failure*. Morristown, NJ: General Learning Press.

Wellman, H. M. (1983). Metamemory revisited. In M. T. H. Chi (Ed.), *Trends in memory development research* (pp. 31-51). Basel, Switzerland: Karger.

Wilson, T. D., Lindsey, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review, 107*, 101-126.

Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., & Leirer, V. P. (1983). Development and validation of a geriatric screening scale: A preliminary report. *Journal of Psychiatric Research, 17*, 37-49.

**APPENDIX A**  
**VIGNETTES AND RATING SCALES**

## Vignettes

**Errands (Practice 1):** George is a 25/65-year old man who is very active in his community and he enjoys doing volunteer work. He is involved in his neighborhood association. They are planning to build a new park in his neighborhood. George offered to serve on the planning committee, which meets the last Thursday of each month. George decided it would be nice to bring a snack to the next meeting. Before the meeting, he made his typical grocery store run. In addition to his regular shopping, he was going to buy paper plates, napkins, and cookies for the meeting. George forgot to buy the paper plates.

**Place (Practice 2):** Elizabeth is a 27/67-year old woman who is very conscientious. She enjoys doing helpful things for other people. Recently, Elizabeth took care of her neighbors' cat while they were away on vacation. She fed the cat and changed the litter box. As a way of saying thank you, the neighbor gave Elizabeth a gift certificate to one of her favorite stores. Elizabeth decided to put the gift certificate away for safekeeping until she was ready to go shopping. Later that month, she went to look for the gift certificate. She could not remember where she had put it.

**Absentmindedness:** Marjorie is a 30/70-year old woman who likes to spend the weekends working in her garden and taking care of household tasks before the new week begins. She spent last Saturday morning catching up on some personal correspondence. She wrote several letters to out-of-town friends and some notes to relatives thanking them for the gifts and cards they sent for her birthday. As soon as she had finished and sealed the last letter, she went upstairs to the study to get some postage stamps. She wanted to put the letters out for the mail carrier to pick up that day. When she got to the top of the steps, she forgot what she went upstairs to get.

**Retrieval:** Dean is a 36/76-year old man who enjoys spending time with his wife and family and he likes to read. He usually accompanies his wife to a continuing education course she is taking that meets every Saturday in a town that is 45-minutes away from the town in which they live. While his wife is in class, Dean often reads a book in the lobby. One Saturday Dean noticed another woman in the lobby. The two exchanged hellos and she told him that she was waiting for her husband who was taking the same course. They enjoyed a pleasant conversation while they waited. Recently Dean ran into the woman while at the local mall. The woman said hello to Dean and he returned the greeting, but Dean did not remember the woman.

**Names:** Bill is a 34/74-year old man who is very outgoing. He's an art and music enthusiast, but he also enjoys cooking and socializing at parties. Recently, Bill attended a party in the home of a friend in honor of the friend's birthday. During dinner, he sat beside a woman, Kathy, who recently moved to town. Bill and Kathy enjoyed a pleasant conversation during dinner and found that they had many interests in common. They talked at length about a museum exhibit they had both seen and really enjoyed. After dinner, Bill began to introduce Kathy to another person at the party, Jim. Bill could not remember Kathy's name.

**Conversation:** Mary Ann is a 32/72-year old woman who is a member of a local book club. Her favorite pastime is reading, and she enjoys talking about the books she has read. Once a month, the book club meets at the community library near her house to discuss a book that all the

members have agreed to read. Last week at the meeting, they were taking turns discussing the most recent book they read, a murder mystery. One of the members made a comment about the main character in the book, which reminded Mary Ann of something that she wanted to say about the same character. However, when it was her turn to speak, she forgot what she had planned to say.

**People:** Ann is a 36/76-year old woman who is very active in her community. She is interested in current events and state and local politics. She often attends a monthly lecture series that meets at her neighborhood community center. The lecture topics include local politics, neighborhood improvement issues, and timely topics, such as tax law changes. At break, Ann usually visits with Nancy, another person that regularly attends the lecture series. Ann and Nancy do not know one another outside of the lecture series, but they enjoy discussing issues brought up at the lecture. Yesterday, Ann ran into Nancy while waiting in line at the deli counter at the grocery store. Nancy said, "Hello." Ann recognized Nancy's face, but she could not remember where she had seen her before.

**Rote:** Richard is a 23/63-year old man who has a lovely voice and often sings in the church choir. Last Saturday, he promised to drop off some materials at the choir director's home, but he was behind schedule in running errands. Richard decided to call the director to tell her that he would be a few minutes late, but he did not have her telephone number with him. Using his mobile phone, Richard called his wife at home and asked her for the phone number. He did not have a pen handy, so he quickly hung up and began dialing the number his wife had given him. After dialing the first three numbers, he forgot the rest of the phone number.

## Causal Attribution and Memory Opinion Rating Scales

### Part I: Opinions about the Causes of the Forgetting

Listed below are six possible reasons for the central character's forgetting. For each reason, please rate how likely you think that reason is the cause of the forgetting, where 1 = *not at all a cause of the forgetting* and 7 = *very much a cause of the forgetting*.

	not at all a cause	2	a little bit	4	quite a bit	6	very much a cause
	1	2	3	4	5	6	7
Poor memory ability	1	2	3	4	5	6	7
Lack of effort	1	2	3	4	5	6	7
Difficulty remembering that type of thing	1	2	3	4	5	6	7
Bad luck	1	2	3	4	5	6	7
Other things going on around the central character	1	2	3	4	5	6	7
Other things on the central character's mind	1	2	3	4	5	6	7

### Part II: Opinions of the Forgetful Person

Please rate how much you think that the central character's forgetting is a sign of mental difficulty, where 1 = *absolutely no indication of mental difficulty* and 7 = *without a doubt a sign of mental difficulty*.

no indication of mental difficulty	2	a little bit	4	quite a bit	6	without a doubt a sign of mental difficulty
1	2	3	4	5	6	7

Please rate how much you think that the central character should seek memory training techniques to improve his/her memory in similar situations, where 1 = *absolutely no need for memory training* and 7 = *definite need for memory training*.

no need for memory training	2	a little bit	4	quite a bit	6	definite need for memory training
1	2	3	4	5	6	7

Please indicate at what point you think evaluation should be recommended for the central character in order to determine whether his/her forgetting was caused by medical and/or psychological problems: (circle one)

1. I see no need for evaluation no matter how often it happens.
2. If it happens several times a day.
3. If it happens once a day.
4. If it happens several times a week.
5. If it happens once a week.
6. If it happens once a month.
7. I would recommend an evaluation the first time it happens.

**APPENDIX B**  
**SEMINAR DEVELOPMENT**

## **Grandparent Seminar Brief Content**

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- I. Introduction
  - A. Goals of talk
  - B. Outline of talk
  - C. Societal changes that have increased interest in the grandparent-grandchild relationship
  
- II. Describing the Grandparent-Grandchild Relationship
  - A. Defining the bond between grandparent-grandchild
    - 1. Frequency of Social Contact
    - 2. Types of Help and Assistance
    - 3. Perceptions of Obligations
  
  - B. Grandparenting Styles
    - 1. Companionate
    - 2. Remote
    - 3. Involved
  
  - C. Mediators in the Grandparent-Grandchild Relationship
    - 1. The Middle Generation (Parents)
    - 2. Proximity
    - 3. Age
    - 4. Gender
  
- III. What Grandparents and Grandchildren “gain” from one another
  - A. Personal Meaning for Grandparents
    - 1. Valued Elder
    - 2. Immortality Through Clan
    - 3. Reinvolvement with Personal Past
  
  - B. Grandparents from the Grandchild’s Perspective
    - 1. How Grandchildren View Grandparents
    - 2. Emotional Benefits to Grandchildren
  
  - C. The Influence of Divorce on the Grandparent-Grandchild Relationship
    - 1. Custody Arrangements
    - 2. Changes in Frequency of Contact
    - 3. Changes in Types of Assistance
  
- IV. Conclusion

## Memory Aging Seminar Brief Content

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- I. Introduction
  - A. Goals of talk
  - B. Outline of talk
  - C. Normal vs. Pathological Memory Aging
  
- II. Understanding Memory
  - A. 3 Stages of Memory
    - 1. Sensory Memory
    - 2. Short-term Memory
    - 3. Disruptions in STM
  
  - B. Long-term Memory
    - 1. Semantic Memory
    - 2. Procedural Memory
    - 3. Episodic Memory
    - 4. Overlap in Semantic & Episodic Memory
  
  - C. Age-related Changes in Memory
    - 1. Changes in sensory and Short-term Memory
    - 2. Declines in Long-term Memory
    - 3. Caveats to declines in Long-term Memory
  
- III. Forgetting (and Remembering!)
  - A. Types of Memory Errors
    - 1. Transient Forgetting
    - 2. Blocking
    - 3. Absentmindedness
  
  - B. Principles of Encoding and Retrieval
    - 1. Successful Remembering
    - 2. Encoding Techniques
    - 3. Retrieval Strategies
  
  - C. Changes in Encoding and Retrieval
    - 1. Age-related changes in encoding
    - 2. Age-related changes in retrieval
  
- IV. Conclusion

## KMAQ Normal Aging Items Included in the Memory Aging Seminar

% Percentage of sample ( $N = 80$ ) answered correctly	KMAQ Item
90%	17. Memory for how to do well-learned things, such as reading a map or riding a bike, does not change very much, if at all, in later adulthood. <i>True</i>
88%	13. If an older adult is unable to recall a specific fact (e.g., remembering a person's name), then providing a cue to prompt or jog the memory is unlikely to help. <i>False</i>
74%	16. For older adults, the ability to remember something is unrelated to the number of other thoughts or issues on their mind when trying to recall this information. <i>False</i>
64%	24. Modern day memory improvement methods that are based on organization (e.g., grouping similar items together) and association (e.g., linking new information to what is already known) can actually be traced back to the ancient Greek scholars, such as Aristotle and Plato. <i>True</i>
53%	2. Older people tend to have more trouble concentrating than younger people. That is, older people are more likely to be distracted by background noises and other happenings around them. <i>True</i>
48%	10. Older people tend to remember specific past events in their daily life better than they remember the meanings of words (vocabulary) and general facts (such as the capital of the United States). <i>False</i>
39%	20. Immediate memory (such as repeating a telephone number) is about the same for younger and older people, but an older person's memory for things that happened days, weeks, or months ago is typically worse than that of a younger person. <i>True</i>

## **Comparison of Vignette Forgetting and Forgetting Examples from the Memory Aging Seminar**

Vignette forgetting (based on Erber et al., 1990a, and Herrmann & Neisser, 1978):

**Rote:** Forgetting phone number before dialing

**Retrieval:** Forgetting someone you met only once before

**Place:** Forgetting where you put a gift certificate

**People:** Forgetting a name to a familiar face

**Absentmindedness:** Forgetting what you went to get in another room

**Conversation:** Forgetting what you were about to say in a conversation

**Names:** Forgetting the name of a new acquaintance

**Errands:** Forgetting an item at the grocery store

Seminar forgetting (based on Herrmann & Neisser's, 1978, Inventory of Memory Experiences):

**Rote:** Forgetting directions

**Retrieval:** Forgetting an actor's name from a TV show or movie

**Place:** Forgetting how to get to a place you have been to before

**People:** Forgetting your waiter at a restaurant

**Absentmindedness:** Forgetting something at home and having to go back and get it

**Conversation:** Forgetting the punch line to a joke

**Names:** Forgetting the brand name of your allergy medicine

**Errands:** Forgetting to go to the dry cleaners

**APPENDIX C**  
**GUIDED NOTES**

## Guided Notes for Grandparent Lecture

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1. What is one reason that laypersons and researchers have become interested in grandparents in the past century?

\_\_\_\_\_

2. What are 3 ways to describe the bond between grandparents and grandchildren?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. What are 3 grandparenting styles?

\_\_\_\_\_ - are playful companions to their grandchildren

\_\_\_\_\_ - more ritualistic in their interactions with grandchildren

\_\_\_\_\_ - very active grandparenting role; usually have daily contact with grandchildren

4. What are 4 things that can mediate the bond between grandparents and grandchildren?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. What are 3 types of personal meaning that grandparents gain from their relationship with grandchildren?

\_\_\_\_\_

\_\_\_\_\_

6. How would you characterize the emotional benefits that grandchildren receive from loving and involved grandparents?

a) Loving grandparents give grandchildren unconditional love and acceptance.

True            False

b) Grandparents play a variety of roles in the lives of grandchildren.

True            False

c) Grandchildren do not focus on the things that their grandparents give them.

True            False

d) Grandparents provide grandchildren with a positive model for aging.

True            False

7. What is one aspect of divorce that can influence the bond between grandparents and grandchildren?

\_\_\_\_\_

8. Who usually gets to see grandchildren more frequently after divorce? (circle one)

Custodial Grandparents

Noncustodial Grandparents

9. Who usually lives the farthest away from grandchildren after divorce? (circle one)

Custodial Grandparents

Noncustodial Grandparents

10. Who usually provides more financial and childcare assistance to parents and grandchildren after divorce? (circle one)

Custodial Grandparents

Noncustodial Grandparents

## Guided Notes for Memory Aging Lecture

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1. Declines in memory that are associated with diseases are called?

\_\_\_\_\_

2. Minor changes in memory that are present in varying degrees in most people over the age of 65 are called?

\_\_\_\_\_

3. What are the 3 stages of memory?

\_\_\_\_\_ - brief recognition of what the senses take in

\_\_\_\_\_ - similar to “conscious thought”

\_\_\_\_\_ - like one’s “memory bank”

4. What are 3 types of long-term memories?

\_\_\_\_\_ - memory for world knowledge and word meaning

\_\_\_\_\_ - memory for well-learned skills

\_\_\_\_\_ - memory for things that can be linked back to a specific time and place

5. What happens to each of these aspects of memory as you get older? (circle one)

a) Sensory memory:	Gets better	Gets worse	No change
b) Short-term memory:	Gets better	Gets worse	No change
c) Semantic memory:	Gets better	Gets worse	No change
d) Procedural memory:	Gets better	Gets worse	No change
e) Episodic memory:	Gets better	Gets worse	No change

6. How would you characterize age-related changes in episodic memory?

a) Older adults forget details more rapidly than younger adults

True            False

b) Age-related declines are relatively small

True            False

c) Every older person suffers from severe memory loss with age

True            False

7. What are 3 types of memory errors?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. Getting information into long-term memory is called?

\_\_\_\_\_

9. Getting information out of long-term memory is called?

\_\_\_\_\_

10. What happens to each of aspect of memory as you get older? (circle one)

a) Concentration/Distractibility

Gets better            Gets worse            No change

b) Usefulness of Encoding Strategies

Gets better            Gets worse            No change

c) Blocking

Gets better            Gets worse            No change

d) Usefulness of Retrieval Cues

Gets better            Gets worse            No change

## VITA

Susan Brigman is originally from Atoka, Oklahoma, and received her bachelor of arts in psychology from the University of Oklahoma, Norman, in December 1988. She received her master of education in professional counseling from Oklahoma City University, Oklahoma, in December 1991. She was employed as an Education Specialist by the United States Air Force from 1989 –1997 and was stationed at Tinker Air Force Base, Oklahoma, Kadena Air Base, Okinawa, Japan, and Kelly Air Force Base, San Antonio, Texas. Susan received her master of arts in psychology from the Louisiana State University and Agricultural and Mechanical College, Baton Rouge, Louisiana, in May 2000 and will be awarded her doctorate in psychology in May 2004. Susan's husband is United States Air Force Major William L. Brigman, currently stationed at Ramstein Air Base, Kaiserslautern, Germany. Upon completion of her graduate training, Susan will be joining her husband in Germany.