SELF-EFFICACY AND MEMORY AGING:

By

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If you believe it, you can achieve it. This popular phrase of personal empowerment has often been utilized in Hollywood and athletics as a performance enhancing motivator. But is it really true? While its optimism and simplicity may make it appealing, from a scientific perspective, surely there are other, more relevant and superior determinants of peak performance. Or are there? Despite constituting a major area of empirical interest (and productivity) for psychologists studying cognitive aging, identifying the strongest predictors of memory performance has proven elusive. Achieving this, however, would be extremely valuable. From a theoretical perspective, understanding precisely which mechanisms most powerfully influence memory performance will enhance our ability to distinguish normative from pathological cognitive aging. From an applied perspective, this knowledge will guide and enhance future interventions with individuals worried about their current memory performance; consistently a central concern of the aged. Two variables receiving considerable attention in the older adult memory performance literature, and the focus of this paper, are self-efficacy and depression. Specifically, I will explore the interrelationships of general and domain-specific self-efficacy, memory performance and depression in aging.

CHAPTER 1
INTRODUCTION

Bandura (1997) describes his Social Cognitive Theory as a "multifaceted, causal structure that addresses both the development of competence and the regulation of action" (p.34). A primary component of this theory is perceived self-efficacy, which refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3). Implicit in this definition is the notion that people are active, agentic contributors, rather than solely determiners or recipients of what actually happens to them. People are simultaneously *agents* and *objects*, at once acting on the environment and reflecting and acting on themselves. Self-efficacy is one's sense of competence and confidence for a given task in a given domain. It is neither a global self-evaluation nor a static, fixed entity. "It is dynamic and malleable, subject to changes in task demands, situational determinants, social context, and individual development." (Berry & West, 1993, p.353)

There are four primary sources of self-efficacy. Enactive mastery experiences, which serve as indicators of capability; vicarious experience, which alters efficacy beliefs via transmission of competence and comparison with attainments of others; verbal persuasion and social influences that communicate to the individual that he or she has certain capabilities; and physiological and affective states, from which individuals judge their own capability, strength, and vulnerability to dysfunction (Bandura, 1993). Any given influence may operate at any time via one or more of these sources. Of these multiple sources, perceived self-efficacy is most readily strengthened through direct, mastery experiences, termed ***enactive*** mastery, where people actively master particular behavioral domains, rather than observing others' successes vicariously.

Bandura describes four behavioral steps that humans engage in during their daily transactions: analyze a situation, consider alternate courses of action, judge one's ability to carry out this action successfully (self-efficacy), and finally, estimate the results such actions are likely to produce. Based on judgments derived from these estimates, people act and later reflect on how well their thoughts served them in managing the given event, then make changes to their thinking accordingly. In this way, individuals' level of motivation, affective states, and actions are based more on what they believe than on what is objectively true, with self-efficacy beliefs playing the central role in the link between beliefs and behavior.

Fundamental to self-efficacy theory is the notion of Triadic Reciprocal Causation (see figure 1). The person (P), environment (E), and behavior (B) each interact and affect each other bidirectionally.

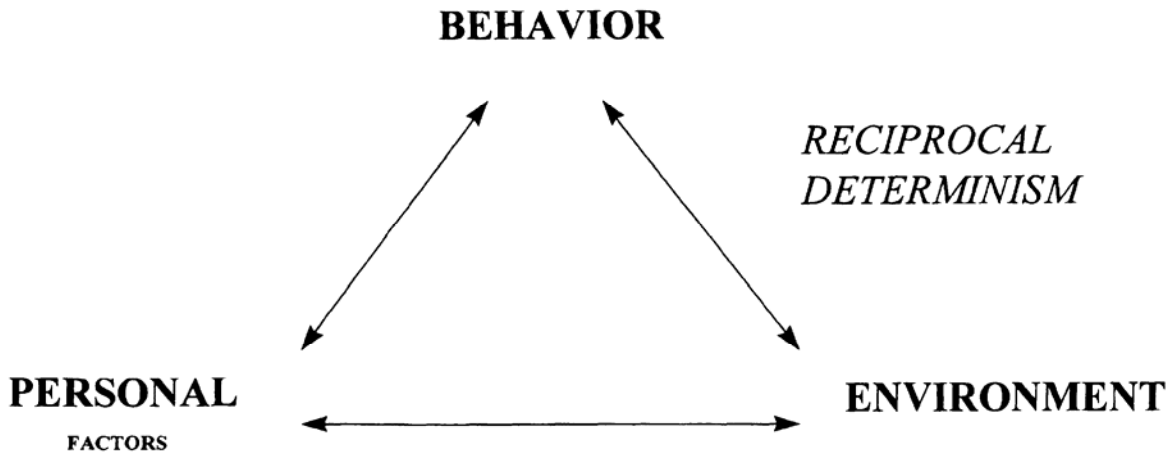

Figure 1-1. Reciprocal Determinism (Bandura, 1986; Pajares, 1996)

Each set of determinants has varying amounts of influence depending on the activity and circumstances. Furthermore, causal factors take different amounts of time in exerting their influence. Berry & West (1993) have called this a feedback loop, to describe the circularity of motion through which past performances influence future judgments of self-efficacy that, in turn,

influence future performance. Performance and its appraisal feed into subsequent judgments of self-efficacy. Cervone, Jiwani, & Wood (1991) have further substantiated this model, showing the unique and independent contribution of self-efficacy to performance, even after controlling for prior performance accomplishments and ability.

Positive performance associated with higher self-efficacy suggests the opposite is also true, that is, poor self-efficacy impedes or has a negative impact on performance (Welch & West, 1995; Artistico, Cervone, & Pezzuti, 2003; Pajares, 1996). Diminished efficacy beliefs can often lead to performance debilitation (Bandura, 2001; Rejeski, Miller, Foy, Messier, & Rapp, 2001; Zeldin & Pajares, 2000). Those who doubt their capabilities in particular domains of activity shy away from difficult tasks in those domains, thus limiting their future opportunities for mastery. This can lead to feelings of stress and depression. "People who possess attributes that are socially disparaged, and who accept the stereotyped negative evaluation of others will hold themselves in low regard irrespective of their talents" (Bandura, 1997, p.13). For example, older adults may "buy in" to the notion that any instance of forgetting may be a sign that they are, in fact, "going senile," even if their memory ability is objectively unimpaired. Conversely, those who have strong beliefs in their capabilities view difficult tasks as challenging opportunities for mastery, as opposed to threats to avoid. According to Bandura (1997), an "efficacious outlook enhances performance accomplishments, reduces stress, and lowers vulnerability to depression" (p.39).

While specific skills may facilitate performance, they are not the primary concern of self-efficacy. Rather, what is essential is what you believe you can do with "what you have" under a variety of circumstances. Self-efficacy and competence, though related, are independent from one another. According to Bandura's model, human competence manifests itself diversely rather

than uniformly across various activity domains. "People develop different patterns of competence and deploy them selectively depending on the match of specific efficacy beliefs to environmental demands and anticipated outcomes" (Bandura, 1997, p.15). What if competence is objectively lacking? Evidence suggests that building self-efficacy is more important than building particular skills (Asante, Brintnell, & Gross, 2007). This is not to suggest that compensating for lacking skills is an easy task. Rather, self-efficacious individuals are able to display consistent effort, even when confronting obstacles and impediments to peak performance. Higher self-efficacy translates into the capacity and willingness to put forth and sustain such effort. Through this self-regulatory function, self-efficacy plays a stronger role in achieving performance attainments than does inherent capacity (Bandura, 1986).

Self-efficacy is commonly misconceived as interchangeable with similar concepts such as self -concept and self-esteem. Self-concept is more global and differs from self-efficacy in that it does not consider domain differences, different levels of task difficulty within one particular domain, or different situational or contextual circumstances, any of which may affect self-efficacy judgments. Similarly, self-esteem refers to more global judgments of self-*worth*, whereas self-efficacy pertains to personal *capability*. It is quite possible for individuals to judge themselves inefficacious in a particular domain without suffering any corresponding loss of self-esteem if they do not invest their self-worth in that domain (Bandura, 1986, 1997). For example, the self-esteem or self-concept of individuals deficient in reading or arithmetic skills will not necessarily be adversely affected if these individuals measure their worth by other areas, such as their singing or athletic ability. As long as they are satisfied with these two areas (singing/athletics), such individuals may overlook or be unaffected by difficulties elsewhere (reading/arithmetic).

Conversely, for people concerned with their reading and arithmetic skills, and aware that they cannot hold a key nor catch a football, the opposite could hold true. Singing and athletic ability will not matter, so long as they are content with their reading and arithmetic. Consistent with these examples, perceived self-efficacy accurately predicts the personal goals individuals set for themselves and their corresponding performance attainments. Self-esteem, on the other hand, does not affect personal goals or performance (Mone, Baker, & Jeffries, 1995). Suffice it to say "there is neither conceptual nor empirical justification for construing self-worth globally, nor is self-esteem the generalized embodiment of specific efficacy beliefs" (Bandura, 1997, p.12).

Self-Efficacy: Aging and Memory

One segment of the population for which self-efficacy may be particularly relevant is older adults. As people age, they often witness, first hand, changes that can affect them both physically and psychologically. Increased longevity can bring with it many benefits and challenges. However, youth-oriented societies, such as the United States, continuously communicate anti-aging messages regarding "inevitable" age-related losses, while minimizing or completely ignoring the concomitant gains. Does the perpetual reinforcement of ageist stereotypes affect older adults' self-efficacy? According to Bandura and others, the answer is yes. As the following illustration demonstrates, these social messages may be internalized by older adults (e.g., Rahhal, Hasher, & Colcombe, 2001).

Let us consider a common example. An elderly woman meets someone she knows at a social event and is unable to recall that person's name. Aside from being embarrassed, she may become exceedingly discouraged and unsure of herself, concerned that she is "losing it." Attributing this memory lapse to an overall deficit in memory capability, rather than an isolated instance of forgetfulness, the older adult may suffer a reduction in self-efficacy, which, in turn,

may decrease the likelihood of attending such events in the future, due to fear of similar embarrassment. Scenarios such as these, "in which individuals happen to perform poorly, can, in themselves, come to activate a sense of incompetence that impairs future performance in those particular contexts" (Bandura, 1997, p.18). Though subtle, it is important to acknowledge that while successful mastery experiences can lead to positive performance and increased confidence, failure can similarly contribute to negative performance and decreased confidence.

Because of the expectation (among both young and older adults) that memory declines in late life, older adults may explain each lapse of memory as further evidence of age-related cognitive decline while younger individuals free of such expectations can and do attribute the same lapses to other phenomena unrelated to decline, such as low interest, stress, or distraction. Gerontologists have referred to this as the "age-based double standard," and have noted its influence on memory in particular (Zarit et al., 1981; Erber, 1999; Erber et al., 1996; Erber et al., 1992; Erber & Rothberg, 1991; Erber et al., 1990). Therefore, it seems feasible that memory self-efficacy (MSE) could plummet in older adults who blame aging for all their memory lapses.

Does MSE vary by age? In their comprehensive review of the literature, Berry & West (1993) found strong converging evidence for a poorer sense of MSE in older adults relative to young adults. This has been observed across several different types of measures including MSE factor scores derived from the Metamemory in Adulthood questionnaire (Cavanaugh & Poon, 1989; Hertzog, Dixon, & Hultsch, 1990; Hultsch, Hertzog, Dixon, & Davidson, 1988), single item self-efficacy predictions for memory tasks (Hertzog et al., 1990; Rebok & Balcerak, 1989), and multilevel, task-specific measures of MSE strength & level (Berry et al., 1989; West et al., 2002; West & Yassuda, 2004; West et al., 2005).

In a set of analyses examining the convergence of two metamemory questionnaires, the Metamemory in Adulthood questionnaire (MIA) and the Memory Functioning Questionnaire (MFQ), Hertzog, Hultsch, & Dixon (1989) employed confirmatory factor analysis to identify a distinct Memory Self-Efficacy (MSE) factor. The authors administered both questionnaires to two samples, each of which was broken down further into younger and older subsamples. The seven subscales from the Metamemory in Adulthood (MIA) instrument (Dixon & Hultsch, 1983, 1984) contained 108 items, in a 5-point Likert response format. Hertzog et al. (1987) previously reported that the MIA scales of Capacity, Change, Anxiety, and Locus all loaded on a dimension interpreted as Memory Self-Efficacy. The Memory Functioning Questionnaire (MFQ), developed by Gilewski et al. (1983; see Gilewski & Zelinski, 1986) contained 64 items, in a 7-point Likert format, tapping multiple dimensions of metamemory, with a primary focus on memory problems and frequency of forgetting in specific domains (e.g., forgetting appointments). The authors posited that when individuals self-report incidents of forgetting, they do not simply perform an exhaustive retrieval search of memory for forgetting episodes, rather, they first access beliefs about their memory self-efficacy and then convert these beliefs into a frequency estimate. Based on this logic, they hypothesized that the MFQ also contains scales that might be included within the self-efficacy category, primarily those related to the frequency of forgetting dimension. "Incidents of forgetting are undoubtedly a source of information that individuals use to create and update memory self-efficacy beliefs…the actual frequency of forgetting is likely to be a proximal determinant of memory self-efficacy. " (Hertzog, Hultsch, & Dixon, 1989). Most relevant among the authors' findings was that age was a significant predictor of MSE. "As individuals grow older and perceive more change in memory…they are

also more likely to report lower MSE, resulting in an increased correlation between these factors." (Hertzog et al., 1989, p. 699).

More recently, West & Yassuda (2004) examined the interplay of goal setting, sense of memory control, memory performance, and memory beliefs. Their guiding principle was the higher probability that those with high MSE and internal control beliefs, more often than not, younger adults, would perform well without external encouragement from goals, whereas older adults, typically lower in MSE and memory control beliefs, are more easily discouraged and less likely to perform well without goals to motivate them. The study sample was comprised of older adult community dwellers and students. Memory beliefs, control beliefs, and MSE were assessed, and participants completed a shopping list recall. As in the earlier study mentioned above, younger adults had significantly higher MSE than the older adults. They also showed significantly better memory performance.

Perhaps the most consistent evidence of the MSE-memory performance correlation among older adults has been found by West and her colleagues (West, Thorn, & Bagwell, 2003; West & Yassuda, 2004; West, Dennehy-Basile, & Norris, 1996; West, Bagwell, & Dark-Freudeman, 2005), who have examined it in relation to goal setting. West, Thorn and Bagwell (2003) had college students and older adults complete the MSEQ and then perform a shopping list recall for several trials, with or without a goal and feedback on performance. After the last trial, participants completed the MSEQ again. The authors found that MSE was significantly lower among the older adults. In a regression with final trial MSE as the dependent variable and age, education, health, goal condition, and percentage correct as the independent variables, only age and percentage correct were significant predictors of MSE. After substituting gain scores (improvement across trials) for percentage correct, age was the strongest significant predictor of

MSE. In a second study to partially replicate and extend these findings, the authors administered the MSEQ *after* baseline but not before. Again, recall performance and MSE were significantly higher among younger adults than older adults. As in the first study, the authors regressed MSE on the same independent variables. In order, percentage correct, age, and goal condition were significant predictors. After replacing percentage correct with gain scores, age, once again, was the strongest predictor of final trial MSE.

In a study primarily concerned with the effects of different types of feedback, West, Bagwell, and Dark-Freudeman (2005) compared the use of individualized goals and positive or objective feedback to a control group having no goals and no feedback. A sample of college students and community dwelling older adults completed a shopping list recall and items from the MSEQ-4 (West et al., 2003). Participant memory beliefs, goal commitment, and shopping list recall were measured as well. Again, the authors found younger adults scored significantly higher on recall and MSE than did the older adults. In a multivariate analysis comparing beliefs measured at baseline and after the goal manipulation, the effects of age were significant, with older adults showing lower self-ratings than younger adults.

Is this lower MSE among older adults problematic? While mastery experiences increase self-efficacy, age-related memory changes, social stereotypes, and mastery-reducing experiences act to lower it. Theoretically, a reduction in self-efficacy will have negative behavioral consequences, such as avoidance of learning opportunities and reduced memory effort (Welch & West, 1995). Such behaviors tend to preclude successful cognitive performance in the future. As cognitive errors increase, social stereotypes lead the elderly to automatically attribute these failures to age, even though other factors could be responsible (e.g., lack of attention, lack of effort). The personal experiences of older adults can sometimes fail to encourage mastery, and

may even induce further disability, especially in environments with higher percentages of disabled older adults, e.g., nursing homes and hospitals (Welch & West, 1995). Thus, a vicious cycle ensues as the individual's self-efficacy declines, so does their motivation to maintain independence and self-sufficiency, leading ultimately to increased dependence on others. In areas of skilled competence, such as memory, failure to actively utilize skills can theoretically lead to loss of capability. I will now consider empirical evidence for this relationship between MSE and memory performance.

The correlation between memory self-evaluation and memory performance has been examined in several aging studies addressing these issues: Are self-perceptions of memory ability accurate? Does their accuracy vary across age? Although a wide range of self-evaluative measures have been utilized in this research, here I consider the extant research on self-efficacy in particular, and the relationship between MSE and performance (consideration of more generic self-evaluation assessments occurs in the section on depression and memory self evaluation).

In a mnemonic training study, Rebok and Balcerak (1989) allotted younger and older adults to four different groups; training/feedback, training/no feedback, no training/feedback, and no training/no feedback. The authors assessed self-efficacy with a single-item confidence measure, patterned after Bandura and Adams (1977). Participants rated the strength of their expectations to recall 12 words and 12 digits in their exact order on a 100-point probability scale, ranging in 10-point intervals from 10 *(not sure)* to 100 *(real sure).* The highest number circled on the scale was used as a measure of self-efficacy strength (SEST). They were also asked to predict the number of words (out of 12) and digits (out of 12) they felt they would be able to remember in exact order (self-efficacy level or SEL). Younger adults outperformed older adults

both pre- and post-training and both groups were inaccurate in predicting their respective performance. Both SEST and SEL were higher among younger adults than older adults.

Berry et al. (1989) conducted three studies to demonstrate the validity and reliability of their memory self-efficacy questionnaire (MSEQ). Though the authors' primary aim was to show the psychometric strength of their measure, their findings directly pertain to the MSE-performance relationship. The sample in the first study was comprised exclusively of older adults, each of whom completed the MSEQ, and then performed eight memory tasks. Four of the tasks were considered "laboratory" in nature; word recall, recall of directions for drawing a path through a maze, digit recall, and recall of line drawings. The other four were considered more familiar, "everyday" tasks; remembering a sick friend's grocery list, map directions to a friend's house, telephone numbers, and object locations in a room. The second study examined a sample of undergraduate students. The final study examined a sample of both young and older adults, each of whom completed an alternate form of the MSEQ. Across studies, the authors found a significant relationship between MSE and performance variables for the everyday tasks more often than for the laboratory tasks. In a later study, this pattern of better prediction for everyday tasks was repeated (West, Dennehy-Basile, & Norris, 1996).

Hertzog, Dixon, & Hultsch (1990) used structural regression models to address the nature and degree of relationships between memory predictions and memory performance. Participants, ranging in age from 20 – 79 years old, predicted their performance and then completed two different memory tasks: free recall of words (nouns from multiple taxonomic categories) and free recall of narrative texts. Before each memory task, participants in the memory prediction condition were given a brief description of the task, and fictitious normative performance data, after which they were asked to predict their own performance. They completed this prediction-

performance sequence three separate times. Though many measures were administered, including most subscales from the MIA (Dixon & Hultsch,1983, 1984), the two specifically intended to tap participant MSE were the MIA-Capacity scale, and the Frequency of Forgetting scale from the MFQ (Gilewski et al., 1983; see Gilewski & Zelinski, 1986). As expected, older participants showed significantly lower recall than did younger participants. MIA Capacity and MFQ Frequency of Forgetting scales, both of which have been shown to relate primarily to MSE (Hertzog et al., 1989), and MIA Change, correlated significantly with word and text recall predictions. However, additional MIA and other scales were not significantly correlated with performance predictions. Age and memory performance had no direct influence on word recall prediction when controlling for MSE. The authors' interpretation was that age differences in predictions may be mediated by age differences in MSE.

What can be concluded from these findings? It appears that adults, young and old, are often inaccurate when assessing their own memory performance ability. In fact, in an objective consideration of the literature, one would have to conclude that the results are mixed, at best, regarding the MSE-performance relationship. What accounts for this? One possibility may involve methodology. Common to these studies has been the tendency to combine participants, irrespective of their age, when analyzing the data. If memory performance has different meaning and importance for different age groups, this approach may be problematic. Though it is difficult to find longitudinal studies providing empirical proof, some have suggested that memory becomes more personally relevant as adults age (Lowenthal et al., 1967; Kahn, 1975). Studies by Dixon and Hultsch (1983) and Cavanaugh et al. (1983), have found that older adults say that memory is important to them, rate themselves as having an adequate memory, but still report more instances of memory failure than do younger adults. Memory seems to be

disproportionately salient for older adults. This greater salience is further supported by Poon (1985) who found that 80% of older adults' cognitive complaints are memory-related. It may be that inflated concerns about memory performance among older adults make it a domain of function where beliefs hold more sway (Seeman et al., 1996).

Why is this greater salience relevant? Logically, increased salience tends to translate into increased sensitivity and awareness. In addition to inhibiting memory performance (Rahhal, Hasher, & Colcombe, 2001), such acute sensitivity to memory lapses may, in turn, result in overestimates of the frequency with which forgetting occurs (O'hara et al., 1986; Sugar and McDowd, 1992). Empirically, this could lead to distorted memory self-assessment and impaired performance; and emotionally, it could lead to a self-fulfilling prophecy of continuous memory decrement. The disproportionate salience of memory for older as opposed to younger adults suggests that any inconsistent results mentioned earlier regarding the MSE-performance association may be an artifact of grouping these two populations together. By not separating old from young, potentially meaningful MSE-performance correlations for older adults may have been obscured.

Depression and Memory

As shown above, competence and ability, especially in the domain of memory, become increasingly sensitive issues for people as they age. It stands to reason that declines in these and other areas, objective or perceived, can have sobering effects on an individual. Intuition aside, what impact does lowered self-efficacy have on older adults' mood and affect? Do mood and affect impact self-efficacy? Regardless of directionality, what role, if any, do these factors play with regard to performance?

Of the different affective factors potentially associated with memory performance, past research suggests that depression is the most relevant. Older adults are very familiar with

depression. As much as 15% of older adults may experience subclinical depression (Blazer, 2002) with a chronicity rate of 33% as compared to 10% in younger adults (Cole et al., 1999). Older adults are also more likely than younger adults to experience relapses (Heinze, Villamil, & Cortes, 2002; Reynolds & Kupfer, 1999). To account for this, several theoretical links have been posited. In fact, some have suggested affective factors may be as important in predicting performance as actual capability (Zarit, 1982). "The tendency for older people to convince themselves or be convinced by others that they have a problem may be as important a determinant of their daily functioning as objective changes in ability" (p. 2). Bandura (1997) conceptualizes SE beliefs as the central mediator of cognitive, behavioral, and environmental contributors to depression. Even though depression and SE interact bidirectionally (see triadic reciprocal causation above), Bandura emphasizes that depression/low SE cycles begin with the individual's low SE. For example, an individual feels that she cannot control the "inevitable" decline in her ability to remember her weekly luncheon appointments. This then leads her to feel increasingly depressed and hopeless, which in turn reduces her motivation to even make appointments. As a result, she sees fewer of her friends for lunch, becomes more isolated, and doubts her abilities (in various domains) even more. Given this powerful cycle, it seems quite possible, therefore, that subjective memory reports by older adults could actually reflect depressed mood masked as low memory ability or cognitive decline. Disentangling these variables is crucial as any of them could adversely affect performance.

Empirically, depression and memory were linked decades ago by Kahn et al. (1975) & Gurland et al. (1976), both of whom found significant associations of memory complaints ("negative self-evaluation") and depression. Since then, while researchers have generally agreed that memory complaints are exacerbated in those who are depressed, teasing out the relationship

between subjective memory complaints, objective memory impairment and depression has proved to be difficult (Riedel-Heller, et al., 1999). The presence of depressive symptoms or disorder has been found to correlate with significantly higher levels of memory complaint, (Collins & Abeles, 1996; O'Conner et al., 1990; Grut, Jorm, & Fratiglioni, 1993; Schofield et al., 1997) and various measures of cognitive decline (Paterniti et al., 2002; Wilson et al., 2002). For example, Zarit (1982) found that while age was inversely correlated with memory performance scores, older persons did not report more memory problems (complaints). Further, memory performance accounted for 22% of the explained variance in subjective memory complaints, this figure nearly doubled (38%) after adding depression to the prediction model, suggesting that self-assessment of memory may be more strongly correlated with mood than performance**.** Though fewer in number, other studies, however, have found the opposite pattern, with those who complained actually performing better on objective memory tests than those who did not (Kahn et al., 1975; Williams et al., 1987).

Several studies focusing on memory training have sought to understand how depression might fit in the equation. Best et al. (1992), in a comparison of training interventions, found those in one group showed a significant reduction in memory complaints with little corresponding effect on performance, while those in a second group showed improved performance, but with little corresponding reduction in complaints. Further, depression was not related to complaints for either group (though it should be noted that the sample was largely non-depressed). From these data it appears that memory complaints do not necessarily reflect nor predict deficient memory performance.

Scogin et al. (1985) found that mnemonic training led to improvement in most memory performance tasks, but had little impact on complaints and none on depression. Both *high* and

low complainers were similar in terms of performance and depression. Zarit and colleagues (1981) found that older adults reduced memory complaints after training, even if performance did not improve. Despite complaint reduction, there was no significant association between complaints and performance or depression both before and after training. Change in affective status, but not performance, was related to lessened complaints, suggesting performance may have been more powerfully associated with depression (Zarit et al., 1981).

The equivocal findings regarding the interrelationships of depression, memory complaints, and memory performance are puzzling, especially given that complaining itself is a symptom of depression and it has been shown that memory complaints can resolve if depression lifts (Plotkin et al. 1985). Clearly, navigating through the interplay of these variables is complex, and empirical attempts to do so have yielded inconclusive results. It does appear safe to conclude that the link between depression and memory complaints is more strongly supported empirically than either the association of depression with performance, or complaints with performance.

Before leaving the topic of depression and memory, it is important to note that few of these studies have used clinical methodology to diagnose depression. "Depression" has been measured with a variety of scales (e.g., Beck Depression Inventory, Zung Depression Scale, Geriatric Depression Scale), and diagnostic criteria. Most of the extant literature focuses on samples consisting of few, if any, participants diagnosed with major depression. Rather, it has focused on more general reports of depressive symptomatology. This is a subtle but important distinction between general depressive symptoms (e.g., I sometimes feel blue) and more specific diagnostic criteria (e.g., major depressive disorder). Items aiming to tap general "depression" and items tapping general memory complaints, may capture how an individual feels about him or

herself in general, rather than an individual's confidence in his or her ability to perform a specific task. Given this important methodological nuance in the depression and memory literature, it is unclear how depressive symptomatology will relate to specific measures of MSE. Further exploration of this path is one of the goals of this research. Some of the aforementioned complexity may be related, in part, to measurement issues; which are discussed next.

Self-Efficacy Measurement Issues

Whereas Bandura's conceptualization of self-efficacy has garnered widespread acceptance, firmly establishing how self-efficacy should be measured, has proven more challenging. There is no approach to efficacy measurement that is 100% accepted, therefore measurement issues are important when addressing the role of efficacy and depression in memory performance.

So how should self-efficacy be measured? Bandura distinguishes between *global*, omnibus measures and *domain-specific* measures, the latter being preferable when the goal of research is to "maximize the predictive validity of self-efficacy relative to performance attainments." (Berry & West, 1993, pp. 354-5) "Efficacy beliefs should be measured in terms of particularized judgments of capability that may vary across realms of activity, under different levels of task demands within a given activity domain, and under different situational circumstances" (Bandura, 1997, p.42). In terms of measurement, Bandura stipulates the following: A well-defined and thorough conceptual analysis of the activity domain of interest (i.e., memory), its requisite capabilities (i.e., free recall, recognition, serial recall), and the range of circumstances under which these capabilities may be applied. (i.e., supermarket, post office). He argues that particularized efficacy beliefs are most predictive because they "guide which activities are undertaken and how well they are performed" (Bandura, 1997, p.40). This emphasis on specificity has been supported empirically, as the following examples illustrate.

In two studies with college students, Wang and Richarde (1988) sought to demonstrate that self-efficacy was a *state* not a *trait*, variable. In their first study, the authors compared task-specific measures of self-efficacy with Tipton & Worthington's (1984) measure of generalized self-efficacy, consisting of items addressing expectations of performance competence across a range of activities (e.g., *I am a very determined person, I can succeed at most any endeavor to which I set my mind*). Modified after Bandura & Schunk (1981), the task-specific scale included six performance tasks for which participants assessed their ability on a 10-point Likert scale (1 = *not sure*, 10 = *very sure*). Among the results of a principle components analysis was a bipolar factor for general self-efficacy scores and task-specific measures, with heavy factor loadings in opposite directions. This finding suggests that they were measuring opposing aspects of the same construct (Wang & Richarde, 1988).

In their second study, Wang and Richarde (1988) focused specifically on the relationship between task-specific measures and performance. All participants were pretested on task-specific self-efficacy for mathematical tasks, after being shown examples of such tasks for 2 seconds. They were asked to rate their certainty of correctly performing such tasks on the same task-specific scale used in the first study. Following this pretest, the experimental group was given a few minutes to perform the tasks, and then was posttested for both task-specific efficacy and general efficacy. A control group followed the same pretest-posttest protocol yet was not given the opportunity to perform the tasks. Results showed that while both groups were statistically equivalent on measures of generalized self-efficacy and the pretest measures of task-specific self-efficacy, only the experimental group's posttest task-specific self-efficacy ratings correlated significantly with performance. Although pretest task-specific self-efficacy did not predict performance in this case, the authors attribute this to the brief 2 second exposure to the

tasks, which may not have allowed participants time to adequately appraise their self-efficacy. More importantly, the authors concluded from both studies that general and task-specific scales assess distinctly different aspects of the efficacy construct.

More recently, Earley and Lituchy (1991) conducted several studies examining the relationship between self-efficacy and goal setting among college students. In the first study, participants were assigned to one of two groups varying in goal difficulty ('easy' = complete 80 math problems in 30 minutes, 'challenging' = complete 200 math problems in 30 minutes). Consistent with Bandura's notion, task-specific self-efficacy was assessed via participant self-ratings for five performance levels— 80, 110, 140, 170, and 200 math problems. Participants were then asked what their personal goal was, regardless of the assigned goal. The 17-item General Achievement subscale of Scherer et al.'s (1982) self-efficacy scale was used to measure generalized self-efficacy, referred to as "trait efficacy" by the authors. They also assessed "valence," or participants' predicted level of satisfaction were they to achieve their goal.

Before the authors controlled for the influence of personal goals, task-specific self-efficacy and performance valence accounted for 44% of the variance in performance. However, when ability and personal goals were controlled for, performance valence was no longer significantly related to performance, although self-efficacy was still significant. Conversely, generalized self-efficacy did not significantly contribute to performance when it was entered into a regression equation after accounting for personal goals, task-specific self-efficacy, performance valence, and goal condition. These results were replicated in two subsequent studies with different activities – one involving successful performance on a computer game, the other, a field study examining business students' academic performance during a regular semester. The authors concluded that generalized self-efficacy had no effect on performance in the two

laboratory studies and made an equivocal contribution in the field study, while task-specific self-efficacy proved a superior predictor of performance. They argued that "the weak and null findings for performance valence and trait efficacy call into question the necessity of these constructs for the prediction of performance" (Earley & Lituchy, 1991, p.96).

Clearly, Bandura's case for using specific self-efficacy has been supported by others. However, Schwarzer and colleagues have favored the measurement of a broader construct of general self-efficacy (Schwarzer & Fuchs, 1996; Scholz et al., 2002; Luszczynska, Scholz, & Schwarzer, 2005), which they liken to optimistic self-belief. "An open question refers to the optimal degree of specificity or generality of the self-efficacy construct…Although there is nothing wrong with more and more specificity, there still exist generalized measures that have considerable predictive value (Schwarzer & Fuchs, 1996, p.186).

Schwarzer and Jerusalem (1995) first developed their General Perceived Self-Efficacy Scale (GSE) to measure personal agency, that is, the extent to which one believes his or her actions are responsible for successful outcomes, in any domain. Their original aim was to predict coping with daily hassles and adaptation in the face of stressful life events. More recently, Schwarzer and his colleagues have focused extensively on health behavior in general. Their results indicate that both general and specific self-efficacy have unique predictive value, that is, results obtained from one do not imply similar results from the other (Luszczynska, Scholz, & Schwarzer, 2005). In light of this, Schwarzer and others (e.g., Cervone, 1997) have called for direct comparison of both general and specific self-efficacy measures; a call that except for the studies presented here, has largely gone unheeded.

Current Study

Informed by the data cited thus far, the current study has several primary aims. First, I will consider the relationship of memory performance to different types of self-efficacy--

domain-specific and general--to compare their respective predictive power. To my knowledge, this is the first head-to-head empirical comparison of general and specific efficacy measures with respect to prediction of memory performance. Because self-efficacy beliefs can vary in importance and relevance over the course of life as a function of the individual salience of a given domain at a particular point in time (Bandura, 1997; Berry & West, 1993), and because memory appears to hold more salience for the older population, the current research focuses on a sample of community-dwelling elders with an expressed interest in memory. In addition, this research explores the potential effects of depression on memory performance; a link that has been theoretically posited, but whose empirical support, to date, has been inconclusive. Finally, in analyzing each variable of interest, there will also be a focus on potential age differences among the older cohort. The current sample, comprised of participants aged 50 – 90 years old, offers a fairly broad age sample in which to do this.

Hypotheses

1. Bandura's theoretical concepts, supported by the empirical examples above, lead to the conclusion that specific self-efficacy, as opposed to general self-efficacy, will be the strongest predictor of performance. It is therefore hypothesized that older adult memory performance will be more robustly correlated with memory self-efficacy than general self-efficacy.
2. It is hypothesized that as age increases, there will be a concomitant increase in predictive power of MSE on memory performance. Across psychological and gerontological research, the common classification of older adults may be somewhat misleading. Though some have broken this demographic down into *old* and *oldest-old* (i.e., >85yrs.), or young-old (<70 yrs.) and old-old, more often than not, the older adult population has been considered together in a relatively unsystematic way. Doing this may mask the

potential heterogeneity of this population. This becomes most relevant when considering the theoretical increase in salience of memory over time. If such increased salience leads to increased awareness and sensitivity, it is likely that MSE will assume an increasingly important role vis-à-vis memory performance as adults grow older.

3. In light of theory and the mixed results linking depression and memory, it is hypothesized that depression will not be as strong a predictor of memory performance as MSE.

CHAPTER 2
MATERIALS AND METHODS

Participants were 193 community dwelling older adults (ages 54 to 92, $M = 70.5$) from north central Florida, recruited to participate in memory training. Demographic data were captured, including age, gender, marital status, race, education level, and subjective health (1 = *excellent health*, 10 = *very poor health*). Participants were primarily Caucasian (97%, n = 187) and female (74%, n = 143). Basic ability measures were administered, including the Digit Symbol subscale of the Wechsler Adult Intelligence Scale-Revised (WAIS; Wechsler, 1981) and The Shipley-Hartford Vocabulary Test (Shipley, 1940). Sample characteristics are reported in Table 2-1.

Memory Self-Efficacy

Memory self-efficacy was assessed with a short version of the Memory Self-Efficacy Questionnaire (MSEQ-4; West et al., 2003) The MSEQ-4 is a 20-item self-report measure of memory self-efficacy for distinct memory tasks. These tasks are name recall (e.g., *If someone showed me the photographs of X people and told me their names once, I could identify Y persons by name if I saw the pictures again a few minutes later)*, remembering items from a grocery list (e.g., *If I heard it twice, I could remember X items from a friend's grocery list of Y items, without taking any list with me to the store*), remembering main points from a story, and remembering the locations of household items. Individuals indicate their confidence level for performing each of these tasks at varying difficulty levels, responding on a scale from 0 *(I cannot do it)* to 100 (*100% sure I can do it*). The dependent measure is self-efficacy strength, calculated as the average confidence rating across all items. The MSEQ is a valid and reliable measure of self-efficacy strength (Berry et al., 1989) and internal consistency reliability in this sample was high ($\alpha = .88$).

General Self-Efficacy

General self-efficacy was assessed with Schwarzer & Jerusalem's (1995) Generalized Self-Efficacy Scale (GSE). This is a 10-item questionnaire that asks respondents to indicate on a 4-point Likert scale (1 = *not at all true*, 4 = *exactly true*), how applicable each statement is to them. Statements include *"I can always manage to solve difficult problems if I try hard enough," If I am in trouble, I can usually think of a solution,"* and *"I can usually handle whatever comes my way."* This scale has shown good validity and reliability in past research (Luszczynska, Gutiérrez-Doña, & Schwarzer, 2005) and, in this sample, the full scale score showed acceptable levels of internal consistency reliability ($\alpha = .83$).

Memory Performance

Shopping list. Participants were given a list of words to study from, then after varying time intervals, they were instructed to write down as many words as they could recall from memory, without the list. Two versions of a partially categorized shopping list were developed (West, Welch, & Thorn, 2001), and participants were randomly assigned to receive one of these two lists. Each list contained 15 items, and participants were allotted one minute to study the items, and up to 4 minutes for recall. This was experimenter-paced. Half of the items on the list were categorizable. The number of correct items recalled was used as the dependent measure.

Names. Participants were shown 3 pages of headshot photographs (4 per page) with a first name under each photograph. Two versions of 12 faces and names were developed and assigned randomly to participants. For both versions, the faces were balanced for age, ethnicity, and gender so that each page of four photographs represented at least two different ages, two ethnicities, and both genders. Participants were given 1 minute to study and 4 minutes to recall the names. Once the study time elapsed, participants turned the page and saw the same photographs with blank bubbles underneath, in which they were instructed to fill in the proper

names that matched each photograph. The number of correct names recalled was used as the dependent measure.

Depression

Depression was assessed using the SF-36 Health Survey (Ware, Jr., 1993), a commonly used measure of overall health, with high validity and reliability (McHorney, Ware, Lu, & Sherbourne, 1994). A scale of five items was used to assess depressed mood (e.g., *Have you been a very nervous person?, Have you felt so down in the dumps that nothing could cheer you up?, Have you felt calm and peaceful?, Have you felt downhearted and blue?, Have you been a happy person?*), following the specifications in the design of the SF-36 (Ware Jr., 1993). Respondents indicated on a 6-point Likert scale (1 = *all of the time*, 6 = *none of the time*) how often they experienced symptoms in the previous four weeks. This scale has been shown to effectively measure depression (Beusterien, Steinwald, & Ware Jr., 1996; Elliott, Renier, & Palcher, 2003). Though a subset of a larger health scale, there was good internal consistency among these items ($\alpha = .83$).

Other Measures

A number of other measures were examined in the primary research from which these data were taken, including The Need for Cognition Scale **(**Cacioppo & Petty, 1982), subscales of Locus, Anxiety, and Achievement from the Metamemory in Adulthood (MIA) questionnaire (Dixon, & Hultsch, 1984), story recall, strategy checklists, a second set of recall trials, other SF-36 items, and an assessment of daily activities. These questionnaires are not relevant to the purpose of this research and will not be considered further.

Table 2-1. Sample Characteristics

Variable	*N*	*M*	*SD*
Age	197	70.32	7.60
Years of Education	197	15.32	2.97
General Self-Efficacy	198	30.74	3.62
Memory Self-Efficacy	193	46.86	16.53
Vocabulary Level	145	33.45	5.61
Depression	196	24.93	3.60
Memory Performance (List Recall)	195	9.50	2.31
Memory Performance (Name Recall)	195	4.80	2.78

CHAPTER 3
RESULTS

Overview

Tests of each hypothesis were conducted with multiple linear regression models. To ensure that these analyses were stable and unbiased, multicollinearity was analyzed and the resulting diagnostics showed acceptable tolerance levels (.84 - .97) for all key variables. Examination of the measures showed normal distribution of all variables except for depression which was skewed (skewness = -1.30, kurtosis = 1.37), likely due to relatively low levels of depressive symptoms within the sample. Normality statistics were all within an acceptable range according to most conventions (e.g., Field, 2005).

Hypothesis I

Hypothesis I was tested using a simultaneous linear regression analysis, directly comparing the two independent predictor variables, general self-efficacy as measured by the GSE (Schwarzer & Jerusalem, 1995) and memory self-efficacy as measured by the MSEQ-4 (West et al., 2003). Separate analyses were conducted for both list and name recall (memory performance). Overall, both models were significant, $F(2,190) = 18.09$, $p < .001$, adjusted $R^2 = .15$ (name); $F(2,189) = 7.33$, $p < .001$, adjusted $R^2 = .06$ (list). However, consistent with the hypothesis, though MSE was significant for both list ($\beta = .22$, $p < .005$) and name ($\beta = .36$, $p < .001$), general self-efficacy was not (both ps>.10).

To further understand the relationship between general and specific self-efficacy as a predictor of memory performance, the analyses were rerun hierarchically with general self-efficacy entered alone first, and MSE added as a second predictor in the second model. As a predictor of name recall, both the first [$F(1,191) = 8.23$, $p < .005$, adjusted $R^2 = .04$] and second models [$F(2,190) = 18.09$, $p<.001$, adjusted $R^2 = .15$, R^2 change = .12] were significant. Though

general self-efficacy was significant in the first model (β = .20, $p < .005$), the addition of MSE in the second model rendered general self-efficacy non-significant (β =.10, $p > .10$), while MSE remained significant (β =.36, $p <.001$). As a predictor of list recall, both the first [$F(1,190) = 5.13$, $p < .05$] and second models [$F(2,189) = 7.33$, $p < .001$, R^2 change = .05] were significant. Again, as with name recall, adding MSE to the overall model rendered general self-efficacy non-significant (β = .10, $p >.15$), while MSE remained significant (β = .22, $p < .005$).

Hypothesis II

Hypothesis II was tested with a multiple regression, with age and MSE, and their interaction, included as predictor variables, and memory performance as the dependent variable. Centered terms (standardized z-scores) were created for both predictors, age and MSE, and these values were multiplied to create an interaction variable (see Jaccard, Wan, & Turrisi, 1990). Hierarchical regression was run separately for both memory tasks. Consistent with the hypothesis, it was expected that when predicting memory performance, the interaction effect of age and MSE would be significant. Confirmation of this would offer indirect evidence of the disproportionate salience of memory for older adults.

For name recall, MSE and age were first entered simultaneously as predictors. The overall model was significant $F(2,196) = 31.31$, $p <.001$, adjusted $R^2 = .23$. Both age (β = -.31) and MSE (β = .35) were significant (both *p*s <.001). After including the interaction term, the overall model showed no significant change in R^2 value $F(3,195) = 20.78$, $p <.001$, adjusted $R^2 = .23$, R^2 change = .000. Main effects of MSE (β = .35) and age (β = -.31) remained significant ($p <.001$), but the interaction term was not significant (β = .01, $p >.50$). For list recall, MSE and age were entered simultaneously as the first predictors. The overall model was significant $F(2,195) = 16.60$, $p<.001$, adjusted $R^2 = .14$ as were main effects of both age (β = -.28, $p <.001$) and MSE (β = .23, $p <.001$). Again, after adding the interaction term, the overall model was significant

$F(3,194) = 11.97$, $p < .001$, adjusted $R^2 = .14$, R^2 change = .01 as were effects for both age ($\beta = -.30$, $p < .001$) and MSE ($\beta = .21$, $p < .005$). The interaction term, however, was not significant ($\beta = .11$, $p > .10$).

Hypothesis III

Hypothesis III was tested using a hierarchical regression analysis with MSEQ-4 score and depression (as measured by items from the SF-36) as the independent variables and memory performance as the dependent variable. Like the tests of hypothesis I, separate analyses were conducted for both list and name recall (memory performance). First, separate regressions were run for each dependent variable with both predictors entered simultaneously. Overall, both models were significant, $F(2,188) = 17.30$, $p < .001$, adjusted $R^2 = .15$ (name); $F(2,187) = 7.37$, $p < .001$, adjusted $R^2 = .06$ (list). However, consistent with the hypothesis, MSE was significant for both list ($\beta = .23$, $p < .001$) and name ($\beta = .37$, $p < .001$), but depression was not ($p > .10$).

To further understand the relationship of these two variables with memory performance, the analyses were rerun hierarchically with depression entered first, then MSE, for both name and list recall outcome variables. Depression as the lone predictor was significant for both name ($\beta = .16$, $p < .05$) and list ($\beta = .14$, $p < .05$) recall. Once MSE was added to the model, depression was no longer a significant predictor of either name ($\beta = .095$, $p > .15$, R^2 change = .13) or list ($\beta = .102$, $p > .15$, R^2 change = .05) recall but MSE was (name -- $\beta = .37$, $p < .001$; list – $\beta = .23$, $p < .001$).

The results of the above analyses demonstrate that in the current sample, age and MSE accounted for nearly 25% of the variance in name recall scores and approximately 15% of variance in list recall. With age variance removed, MSE uniquely predicted almost 12% of the variance in name and 5% of the variance in list recall performance. To further examine the full

predictive power of MSE, exploratory analyses, described below, were run with MSE and other predictors previously associated with memory performance (e.g., West, Crook, & Barron, 1992).

Exploratory Analyses

To investigate just how well MSE stacked up to these and other predictors, an exploratory analysis was later conducted with education and vocabulary added to the model as potential predictors. All six variables (age, education, vocabulary, depression, general self-efficacy, and memory self-efficacy) were entered simultaneously into the regression and separate analyses were run for both list and name recall**.** Together, these variables contributed to an adjusted R^2 value of .30, $F(6,135) = 10.41$, $p<.001$, for name, and an adjusted R^2 value of .13, $F(6,134) = 4.50$, $p<.001$. Significant predictors of *name* recall were age ($\beta = -.29$, $p < .001$), MSE ($\beta = .36$ $p < .001$), and vocabulary ($\beta = .17$ $p = .028$), with MSE as the strongest predictor. Education level, general self-efficacy, and depression were non-significant ($p > .20$). Interestingly, the same pattern was not found for predicting *list* recall. Age remained significant ($\beta = -.28$, $p < .001$), and depression just reached significance ($\beta = .17$, $p = .049$). However, the other variables, including MSE ($\beta = .01$), were non-significant ($p > .10$). Digit symbol tasks, traditionally included when examining working memory performance, were not completed by all participants in the current study. To avoid potential problems related to sample variation, (i.e. low N for digit symbol), this variable was not included as a possible predictor. All univariate correlations are indicated in Table 3-1.

Table 3-1. Correlations Between Predictor and Memory Performance Variables

Variable	1	2	3	4	5	6	7	8
1. Memory Performance (List Recall)	**	.47**	.14*	.25**	.21**	-.31**	0.06	0.14
2. Memory Performance (Name Recall)		**	.21**	.39**	.23**	-.34**	.25**	.15*
3. General Self-Efficacy			**	.28**	.21**	-10	.21*	.32**
4. Memory Self-Efficacy				**	.28**	-0.11	0.13	0.18
5. Education					**	-0.11	.21*	0.1
6. Age						**	-0.01	0.09
7. Vocabulary							**	.17*
8. Depression								**

Note. ** p<.01, *p<.05

Discussion

The current study addressed several interrelationships among self-efficacy, age, depression, and memory performance. To the author's knowledge, this is the first empirical evaluation of task-specific self-efficacy's ability to predict performance compared to both general self-efficacy and other potentially important predictor variables within an exclusively older adult sample. As hypothesized, a direct comparison of memory-specific and general self-efficacy resulted in the former accounting for unique variance, above and beyond that of general self-efficacy, in predicting older adult memory performance. In addition, the current study found that depression by itself significantly predicted memory performance, however, when memory self-efficacy was added to the regression model, depression was no longer significant and memory self-efficacy was retained as a significant predictor. Finally, this research afforded the opportunity to test some interesting theoretical questions concerning the salience of memory for an older population. Contrary to the hypothesis, an examination of the relationship between MSE and performance, as a function of age, did not find any evidence for the increased salience of MSE with age in this sample. Each of these findings will now be considered in detail.

Self-Efficacy

As mentioned earlier, this is the first direct empirical comparison of task-specific and general self-efficacy within the realm of older adult memory performance. The finding that task-specific, but not general self-efficacy, significantly predicted performance could have promising implications. First, these results may prove valuable for future self-efficacy research and measurement (i.e., scale construction) both in cognitive and non-cognitive (e.g., driving self-efficacy) domains. The current finding provides empirical support for Bandura's (1986, 1997) theoretical notion that as a construct, self-efficacy should be measured as particularized beliefs. Often, other related but more general constructs such as self-esteem, self-concept, or general self-efficacy, are posited to directly impact an individual's performance (Schwarzer & Fuchs, 1996). Results from the current study suggest that specific measures of self-efficacy are distinctive from constructs tapping general confidence, and are most relevant to performance.

Though the results presented here show a clear link between MSE and memory performance empirically, the direction of this relationship is less apparent and seems open to interpretation. Does performance predict MSE or does MSE predict performance? Theoretically, Bandura's concept of triadic reciprocal causation, central to self-efficacy theory, suggests bidirectional interplay of these variables. However, he also posits a greater likelihood that individuals approach a new task with pre-existing beliefs about their performance ability, and it is these beliefs that impact successive performances, not vice versa. This notion has been corroborated by empirical data from other domains aside from memory. Several studies have employed similar designs to examine the self-efficacy-performance relationship with college students. Results of this research have been comparable to those from the current study.

Pajares and Johnson (1993) utilized a sample of 30 college students to examine the impact of self-efficacy, both general and task-specific, and anxiety (writing apprehension) on

writing performance. They also investigated any changes in these constructs over the course of an academic term. The authors' results were similar to other empirical evidence (e.g., Siegel, Galassi, & Ware, 1985) and those presented in the current study. General self-efficacy and writing anxiety, though correlated with writing (specific) self-efficacy, did not correlate with writing performance. In fact, though task-specific self-efficacy and performance levels increased throughout the study, anxiety levels remained unchanged. Theoretically, these data seem consistent with Bandura's position that in terms of performance, self-efficacy is task-specific, and matters more than mood. In another study with college students, Lent, Larkin, and Brown (1986) conducted hierarchical regressions to examine self-esteem, self-efficacy and academic performance. Indices of the performance outcome variable included grades and persistence (length of enrollment) measured one year later. The authors found that self-esteem was not correlated with either self-efficacy measures or performance. More importantly, at the 1-year follow-up, students scoring higher initially in self-efficacy had earned higher grades and remained enrolled longer in the college. Task-specific self-efficacy was responsible for approximately 10% of the variance in academic performance above and beyond measures of actual ability, achievement, and interest.

Though these studies utilized young adult samples (raising concerns about generalizability), in terms of directionality, these findings lend support to the notion that it is SE that is influencing performance rather than vice versa. Perhaps the broadest support for this comes from meta-analyses of mnemonic memory training studies which have consistently shown performance is more easily changed (improved) than subjective memory beliefs (see Floyd & Scogin, 1997; Verhaeghen, Marcoen, & Goosens, 1992). The fact that beliefs (i.e., efficacy)

appear less likely to change, at least in the short term, suggests that they are more stable and will likely affect, rather than be affected by, performance.

In light of the impact of SE over and above that of aging, it appears neither prudent nor realistic to view memory decline and impaired performance as inevitable and uncontrollable, a common and detrimental thought process in which many older adults often find themselves engaging. Rather, as Bandura (1997) repeatedly suggests, it seems that over time, optimal performance can be influenced directly by working with and believing in what you have, as opposed to worrying about what you have lost. Bandura makes this explicit, as do Floyd and Scogin (1997), who conclude a meta-analysis on subjective beliefs as follows. "On the basis of the results of this meta-analysis, we recommend that memory improvement programs place more emphasis on modifying participants' attitudes toward aging-related memory loss. Effects on subjective aspects of memory are just as important as, and are arguably more important than, objective memory performance change as indicants of success" (p. 160). Theoretically, the most effective way to enhance self-efficacy is through personal or enactive mastery. Such mastery is distinct, however, from mere performance or experience. Mastery is successful performance that occurs over time. Its resulting effect on self-efficacy is gradual and long term. By directly experiencing even relatively moderate achievements, individuals can gain confidence and build the belief that they can succeed (e.g., West, Bagwell, & Dark-Freudeman, in press). Future research may seek to replicate the current efficacy-performance findings in other cognitive and non-cognitive domains of human functioning and with various age groups.

Age

Age proved to be significantly associated with memory performance. This is not surprising as most prior research on older adult cognition has shown this trend (Berry & West, 1993, West et al., 2003). The current study's utilization of an exclusively older adult sample

(ages 54 – 92yrs.) allowed for a more sensitive and specific assessment of the relationship between self-efficacy and memory performance. As mentioned in the literature review, many studies have analyzed both young and old age groups, together, potentially reducing the impact of SE on performance by including a younger adult population for whom memory performance does not necessarily hold particular salience (i.e., Hertzog et al., 1989, 1990). Theoretically, if SE has a direct effect on performance, then analysis of the memory domain should primarily focus on older adults, for whom memory is posited to be particularly salient. Consistent with this notion, the present study, by excluding younger adults in the analysis, has both avoided any potential reduction of SE impact on performance, and ensured that the results are directly applicable to and indicative of an older adult population.

As mentioned earlier, empirical studies directly demonstrating that memory concerns become more important to people as they age are scarce. Age-related salience as a theoretical construct has, however, received some support (Berry & West, 1983; Lowenthal et al., 1967; Kahn, 1975; Seeman et al., 1996). There is some evidence that the majority of older adults' cognitive complaints are memory-related (Poon, 1985), and that older adults rate memory as important, feel their memory is adequate, yet still report more instances of memory failure than do younger adults (Dixon & Hultsch, 1983; Cavanaugh et al., 1983). Intuitively, it seems that as adults age, especially in youth-focused, ageist societies, they become more aware of their ability and performance, and notice changes, especially in domains in which they're stereotypically expected (and perhaps expecting) to decline. As such awareness increases, individuals' self-beliefs (efficacy) may become increasingly challenged, and regarding memory, temporary episodes of forgetting may be (mis)perceived as evidence of permanent decline. This can inhibit future memory performance (Rahhal, Hasher, & Colcombe, 2001) and result in overestimates of

how frequently one forgets (O'Hara et al., 1986; Sugar and McDowd, 1992). Empirically, this could lead to distorted memory self-evaluation, and emotionally it could lead to a self-fulfilling prophecy such that stereotypical expectations become reality. The current study looked at an exclusively older adult sample which was comparable to prior studies both in terms of self-efficacy level (e.g.,West & Yassuda, 2004) and memory performance (e.g.,West et al., 2005). As mentioned earlier, once age variance was removed, MSE uniquely predicted almost 12% of the variance in name and 5% of the variance in list recall performance. The value for list recall here is slightly lower than that found in earlier research with list recall as a dependent measure (see West & Yassuda, 2004). Name recall, however, compares more favorably to prior studies (see Hertzog, Dixon, & Hultsch, 1990). It should be reiterated, however, that direct tests of the MSE-performance relationship are scarce, and prior studies have operationalized and measured the MSE construct, and memory performance, in different ways. These factors limit the extent to which comparisons of the current results to earlier research can be made.

At the same time, it does not appear that the predictive power of MSE was disproportionately greater for the oldest members of the study's sample. There are several potential explanations for the fact that this hypothesis was not confirmed. First, the sample's age range, although not restricted overall, ranging from 54 to 92 years, was somewhat limited, with few participants below age 60 and very few aged 85 or above (n = 7). Though cut-off ages for *old* and *oldest-old* have been arbitrary and varied across psychological literature, many studies classify the latter as ≥ 85 years old. It may be that increased salience effects do not significantly manifest themselves except in the oldest age ranges. A more effective approach for the future may be to include a more complete age range from mid-life to late life, especially since the

current study's examination of age-related increased salience in a more limited sample yielded non-significant findings.

Additionally, all participants in the current sample expressed interest in memory and memory training as they were recruited explicitly for that purpose. It seems plausible, therefore, that this may have created a ceiling effect, and not allowed for a diverse or increasing range of memory salience; that is, memory concerns may have been salient for most of the group. Although this explanation is plausible, comparisons to other experimental studies show comparable MSE strength means and standard deviations to those reported in this sample (e.g., West et al., 1996). Therefore, it appears that the any restriction of MSE in the current sample was minimal.

Depression

Analysis of depression's potential effect on memory performance and self-efficacy has yielded inconclusive and conflicting results (Scogin et al., 1985, Best et al., 1992). In the current study, depression, as a lone predictor, was found to be significantly associated with memory performance, however, adding MSE to the regression model attenuated this effect such that depression was no longer significant. This finding is consistent with others that have demonstrated depression's link to memory complaints (Gurland et al., 1976; Collins & Abeles, 1996; O'Conner et al., 1990; Grut, Jorm, & Fratiglioni, 1993; Schofield et al., 1997), but not necessarily memory performance. This distinction is supported further by the significant correlation found between depression and general self-efficacy. Though not specifically assessing complaints, per se, the general self-efficacy scale used in the current study is a measure of general mood, tapping how someone is doing (or feeling) overall. It is not surprising, therefore, that these two variables were significantly correlated.

Though the current study has not demonstrated causality, and the verdict is still out as to whether ameliorating depressive symptoms may enhance performance, the preponderance of the results presented here suggests that the role of self-efficacy is stronger than the role of depression with respect to predicting actual performance. This is consistent with Bandura's (1997) emphasis on the stronger role of self-efficacy than depression in explaining performance.

Interestingly, exploratory regression analyses including age, education, vocabulary, depression, and general self-efficacy as predictors, in addition to MSE, yielded inconsistent results. Examining name recall as the outcome variable, MSE was a significant predictor but depression was not. However, when examining list recall as the outcome variable, the converse was true; depression just reached significance (p=.049), whereas MSE did not. Due to some measurement issues in this research, this finding is likely to be spurious (see limitations section).

Memory Performance

Depression and general self-efficacy, as lone predictors, were each significantly associated with both name and list recall performance. Once memory self-efficacy was added to each regression model (i.e., depression and memory self-efficacy; general and memory self-efficacy), it was the only significant predictor of memory performance. This was true for both name and list recall. This finding that memory self-efficacy was more robustly associated with both performance variables was expected and consistent with the study's hypotheses.

Interestingly, there were cases where list recall and name recall appeared to show differential findings, specifically, the predictive power of self-efficacy was stronger for name recall. List and name recall, as outcome measures of memory performance, may have meaningful, qualitative differences. The extant literature provides evidence that name recall is among the most challenging memory tasks, particularly for those advancing in age (Crook & West, 1990; Burke, Worthley, & Martin, 1988). One problem with names is that people treat

them merely as labels, devoid of meaningful information (Cohen, 1990, 1996). Therefore, when trying to remember names, people may not access semantic networks, shown to aid in remembering (e.g., Yesavage, Rose, & Bower, 1983), as they might with lists or other types of meaning-based information. Though speculative, it could be that because names are more difficult to recall, MSE has a greater impact on name memory.

As an alternative explanation, consider that older adults are often sensitive and concerned about their ability to recall people's names when they see them. It seems feasible, therefore, that name recall, more so than other types of memory tasks, may arouse affective or emotional mechanisms (i.e., inducing anxiety) and be perceived as particularly daunting. Mangos and Steele-Johnson (2001) examined SE, performance, goal orientation and subjective task complexity. They found that SE and subjective task complexity (i.e. perceived difficulty) were significantly correlated, and the effects of subjective task complexity on performance were completely mediated by SE.

As mentioned earlier, self-efficacy affects performance not just through cognitive processes, but also via affective and motivational processes. One of the primary advantages or benefits of high self-efficacy is the willingness and ability to tolerate or even fend off increasing anxiety associated with a given activity (Bandura, 1986, 1997). Those higher in efficacy may feel better equipped to tolerate task-related anxiety and may remain motivated to persevere while those lower in efficacy may be quicker to lose motivation, potentially giving up prematurely when facing tasks that are particularly intimidating. Older adults' sensitivity to and difficulty with name recall tasks, coupled with self-efficacy's affective and motivational components, may explain the current finding that MSE was more directly linked to name recall.

Limitations

There are several limitations to this study. Age, gender, and depression levels were not normally distributed throughout the study sample. Though the participants constitute a somewhat large and diverse range of ages (54 – 92 yrs.), and the age variable was normally distributed within the sample, the sample was limited as discussed earlier. The somewhat restricted nature of the sample may have had a negative impact, particularly on the study's ability to identify age-related salience of memory (hypothesis 2). The absence of this finding does not negate the possibility that as age increases across the full life span, so does the salience of memory, and investigators may still wish to address this issue, particularly in longitudinal research.

The sample's distribution of gender was more clearly skewed, as women (74%) comprised nearly three times as many participants as men (26%). This may be relevant as several studies examining self-efficacy have found lower levels among women (Clark & Nothwehr, 1999; Grembowski et al., 1993; Resnick et al., 2000; Shin et al., 2001). Depression both among older adults (Murrell, Himmelfarb, & Wright, 1983) and across the life span (Piccinelli & Wilkinson, 2000) has also been found to be higher among women. Regarding memory performance, several studies have shown higher performance scores among women (West, Welch, & Knabb, 2002; West, Crook, & Barron, 1992). Though this pattern of lower self-efficacy but higher performance among women seems potentially relevant, especially given the majority of participants in the present sample were female, the effects of this on the current study are unclear as memory self-efficacy was normally distributed here. Regarding gender and age, future research might strive to oversample for male participants and seek fuller age ranges. This seems particularly important as human longevity increases and women tend to outlive men in most industrialized nations (Rieker & Bird, 2005).

Depression was assessed in this study with several items from the SF-36, a comprehensive health survey. Though this will capture depressive symptoms, it is not a clinical measure, nor is it sufficiently sensitive or thorough to detect individuals with major depressive disorder. Again, this does not appear problematic given the fact that this was a relatively high-functioning, non-depressed sample, where clinical depression was unlikely. Though it is unclear to what extent these results can be generalized to a more depressed population, arguably, the best way to tap into depressive affect in this kind of sample is to examine symptoms. Such an approach has been implemented with diverse community-dwelling older adults across many domains (e.g., Miller, et al., 2004; Yates & Dunnagan, 2001; Koropeckyj-Cox, 1998**).** However, a better test for the impact of depression would include participants exhibiting varying degrees of depression, as well as more sensitive and specific assessments capable of assessing these differences. In future research with more highly depressed participants, more specific measures of depression might be employed such as the Structured Clinical Interview for Depression (SCID; Spitzer et al., 1992), Diagnostic Interview Schedule (DIS; Robins, Helzer, Croughan, & Ratcliff, 1981), or even self-report measures such as the Center for Epidemiological Study of Depression Scale (CES-D; Radloff, 1977) or the Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988).

As mentioned earlier, results of exploratory analyses showing depression's significance and MSE's non-significance in predicting list recall were surprising. MSE showed a significant univariate correlation with list recall whereas depression did not. It seems possible, therefore, that the impact of MSE may have been suppressed by other variables (education and general self-efficacy, with which it correlated significantly), rendering it non-significant. It should be reiterated that despite this apparent suppressor effect, collinearity diagnostics for all variables

were acceptable. The fact that the sample was skewed toward non-depressed suggests this significant finding may be spurious. The relative ease of the list recall task may have allowed for inflated scores for participants, with the exception of those participants reporting depressive symptoms, for whom scores could be quite low. It is also possible that this finding represents sample variations as later participants in the study did not complete the vocabulary scale, resulting in a much lower N for the exploratory analyses that included vocabulary. Given all of these factors, it is difficult to be confident about the accuracy of this finding, thus any further interpretation is speculative. It seems likely that this resulted more from sample skew than anything else. Future replication with a broader distribution of depression and perhaps alternative memory recall measures might be beneficial.

Clinical Implications

The current results may be directly applied to interventions and training programs with older adults, designed specifically to target and build their memory self-efficacy. MSE's predictive power evidenced here, suggests that aging individuals' perceptions and beliefs about their memory may have a direct impact on their subsequent performance. As outlined in the introduction, although specific intervention designs can vary, to successfully enhance self-efficacy, training must target the four primary sources: enactive mastery experiences, vicarious experience, verbal persuasion/social influences, and physiological/affective states (Bandura, 1993). To reiterate, although each source is relevant, enactive mastery is the most effective experience through which self-efficacy can be maximized.

Empirical attempts to improve memory performance by enhancing memory self-efficacy are sparse, and prior literature suggests memory training is more effective at improving performance than altering subjective beliefs (West, Bagwell, & Dark-Freudeman, in press; Floyd & Scogin, 1997). One such study by Best et al. (1992) targeted *outcome expectancies*, which

Bandura (1986) posits flow from the particular behavior or course of action, serving as incentives or disincentives, depending on whether they are positive or negative. Ageist societal attitudes may contribute negatively and discourage older adults from maximizing performance in highly stereotypic domains of functioning such as memory. In their intervention study, the authors attempted to enhance performance by undoing such negative expectancies and focusing on the positive aspects of aging, benefits of greater self-efficacy, and scientific and medical evidence contrary to such ageist stereotypes. Though successful at lowering memory complaints among their sample, concomitant gains in performance did not occur, perhaps because the opportunities for mastery were minimal.

A more effective design might be patterned after the work of Jones, Burckhardt, & Bennett, (2004) with chronic pain (fibromyalgia) sufferers. Adhering closely to Bandura's four main SE sources, the authors devised motivational interviewing techniques to encourage physical exercise. In their theoretical model, participants learn (by doing) that they are capable of completing previously feared exercises (enactive mastery), observe others similar to themselves experiencing success (modeling/vicarious learning), receive positive encouragement from doctors and physical therapists (verbal persuasion/social influences), and experience decreases in pain, fatigue, and depression (physiological/affective states). A similar approach tailored to older adult memory seems warranted. West and colleagues have facilitated both efficacy and performance gains in their work utilizing goal setting coupled with feedback (e.g., West & Yassuda, 2004; West et al., 2003) and in memory training (West et al., in press).

Empirical literature examining depression's (negative) effects on memory performance has been inconclusive, and Bandura's theoretical stance is clear; low/poor self-efficacy is what initially leads to depression rather than vice versa. In the two-predictor regression models, MSE

significantly predicted both list and name recall while depression did not. In light of these factors, a sensible approach for clinicians working with elders presenting with memory concerns, might be to target self-efficacy directly, in an attempt to maximize memory performance, as opposed to relieving depressive symptoms. This might indirectly fight against or perhaps even stave off depressive episodes or symptomatology. Again, though a bit speculative, prior findings that perceived memory decline is a foremost concern among elders, and Bandura's view that feelings of inefficacy can lead to depression rather than the opposite, suggest that increasing efficacy should be the priority.

Theoretical Implications

Though Bandura theorizes from a life span perspective, self-efficacy theory gives comparatively minimal consideration to efficacy declines in late life and the broader implications of such decrement. Self-efficacy theory does consider aging and even memory, specifically, but gives them brief consideration so far, relative to a focus on efficacy development in childhood. Considering SE's bidirectional nature and its consistently significant relationship with performance, apparent here and elsewhere, more attention should be directed toward the latter part of life and any changes or difficulties unique to this period of functioning. Physiological changes accompanying the normative aging process could make building or even maintaining SE increasingly challenging. It seems logical that the risk of a downward cycle of decreased performance, lowered SE, and subsequent increasingly poorer performance or even task avoidance would be greater as people age. As human longevity increases, this will become increasingly relevant. Relevant theoretical expansion seems warranted to consider a truly comprehensive, life span theory.

In terms of salience, though memory is most relevant to this study, it seems likely that there may be other domains of functioning, not solely cognitive in nature, for which salience, and

therefore importance of SE, may increase or decrease over the life span as well (i.e., falls/balance self-efficacy, vision self-efficacy, driving self-efficacy). Exploration of why such changes might occur could potentially contribute to an extension of Bandura's theory in terms of SE's differential relevance for diverse age groups and its impact on their subsequent behavior or performance. Further empirical analysis and theoretical development with respect to aging and differential salience of various functional domains seem warranted.

Future Research

Self-efficacy theory is a life span model, and thus applicable to people at all ages. However, given that physical and cognitive difficulties are often most prevalent in later life, it seems that beliefs and confidence, core elements of self-efficacy, may be increasingly relevant, and perhaps vulnerable, for older adults. Though the current study did not provide evidence for increased memory salience among older adults, more research is needed, ideally longitudinal in nature and with elder participants from a broad age range, to further examine this posited increased salience. Such a design might also allow for the identification of a particular age or range during which this salience peaks. Recruitment of participants not necessarily interested in memory might also aid in broadening SE and salience ranges. In addition to broader samples, perhaps memory salience can be more directly measured. Scales of memory value, similar to the achievement scale of the MIA (Dixon & Hultsch, 1984) might be effective. One caution, in trying to assess salience directly is that the stereotype threat literature (i.e., Rahhal, Hasher, & Colcombe, 2001) has illustrated time and again that people, especially older adults, may not be consciously aware that certain functional domains hold more salience for them. In short, directly tapping salience may be quite challenging, but it would also have much heuristic value for our understanding of how self-efficacy affects performance in aging.

The breadth of tasks and domains of functioning to which self-efficacy measures can and should be tailored seems limitless. Nevertheless, in order to obtain comparable measures of the link between self-efficacy and performance, our results indicate that it is crucial that specificity be maintained as SE measures are developed for additional domains (e.g., Smith & West, 2006). As stipulated by Bandura and implemented here, SE measures are most useful when they assess individuals' beliefs in their ability to execute a specific task. As research progresses, task descriptions should closely fit the performance domain that is evaluated to ensure the consistency and accuracy of the performance-SE relationship.

Regarding depression, the current study utilized several items to gauge symptoms and the sample was largely non-depressed. This seems to appropriately reflect experiences during late life, a period where the risk for clinical depression does not necessarily increase **(**Roberts, Kaplan, Shema & Strawbridge, 1997**)**, although it is rather common for older adults to report depressive symptoms (see Blazer, 2002; Cole et al., 1999), especially those suffering impaired functioning. Future research might more directly examine the depression-performance relationship by comparing self-efficacy levels among depressed and non-depressed samples longitudinally, to see if changes in depression level might be accompanied by commensurate changes in self-efficacy and subsequent performance both within the domain of memory and others. Such research might utilize samples of more severely depressed participants, and with more sensitive and comprehensive measures of depression, as noted earlier.

CHAPTER 4
SUMMARY AND CONCLUSIONS

The current study succeeded in providing some empirical support for Bandura's theoretical claims, with regard to older adult memory. As predicted, memory self-efficacy, when directly compared both to general self-efficacy, and depression, proved to be the sole significant predictor of memory performance. When other factors were also covaried, self-efficacy retained its predictive power for name recall. Though replication is needed, the results bode well for older adult cognition and Bandura's conception of the self-efficacy construct. It appears that aging individuals need not simply succumb to or view as inevitable any cognitive decline they may experience as part of the normal aging process. Rather, their reaction to and perception of such changes matter. This is grounds for hopeful optimism, and suggests that older adults should feel empowered to play an active role in maximizing their memory ability as they age. As people continue to live longer throughout the industrialized world, the beneficial effects of such empowerment, especially when facilitated by future related psychological research, theoretical development, and clinical interventions, should not be underestimated.

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BIOGRAPHICAL SKETCH

Benjamin Andre' Bensadon was born on April 10, 1974, in New York City. An only child raised in part by his grandmother, Benjamin's affinity and respect for older adults has shaped him as a person and continues to guide his quest to help others. He earned his B.A. in psychology and his Master of Education from Boston University in 1996 and 2000, respectively.

Benjamin has spent substantial time traveling and living in Europe, he is fluent in Italian and is conversant in Spanish. Upon completion of his Ph.D. program, Benjamin will utilize his linguistic, research and clinical skills to maximize his ability to ameliorate human suffering, particularly that of older adults, as broadly as possible.