AN ANALYSIS OF READING MATERIALS AND STRATEGIES
USED BY OLDER ADULTS

A Dissertation by

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I have examined the final copy of this Dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirement for the degree of Doctor of Philosophy with a major in Communication Sciences and Disorders.

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Julie Scherz, Committee Chair

We have read this dissertation
and recommend its acceptance:

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DEDICATION

To my parents,
who always believed I could do anything even when I didn't believe it myself.

And, to Katherine,
my client and friend, who shared her experience with me and inspired me to pursue
this line of research.

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helped to strengthen my resolve to finish. Now, as I look forward, I am confident that if

I've survived these past two years, I can probably do anything I set my mind to!

ABSTRACT

The purpose of this study was to gather information related to reading abilities in typically aging older adults. A variety of strategies had been used in the past to assess reading in older adults. These strategies included the use of questionnaires, diary keeping, and interviewing. Several weaknesses in previous research were noted including lack of diversity in samples, volunteer bias, and social desirability confounds. More importantly, however, none of the previous research examined the scope of components that affect reading and reading-related skills in typically aging adults. The questions guiding this research addressed issues related to the reading and related skills of older adults, the strategies that older adults use to improve reading comprehension, and the types and frequency of reading materials older adults use.

Data for this study were collected from 96 community dwelling adults between the ages of 65 and 79 years. The Word Identification and Word Attack subtests of the Woodcock Reading Mastery Test (Woodcock, 1998) were used as a measure of decoding ability. The vocabulary subtest of the Nelson-Denny Reading Test (Brown, Fishco, & Hanna, 1993) was used as a measure of reading vocabulary. Several nonstandardized tasks were included to examine reading comprehension, phonological awareness, and morphological awareness. Additionally, four survey instruments were used to assess awareness of reading strategies, print exposure, reading habits, and attitudes about reading.

The adults in this study were, as a group, more highly educated than the general population in Kansas. This sample of adults demonstrated reading comprehension and vocabulary skills which were above average as compared to the normative samples on the

standardized instruments. Pearson correlations indicated that reading comprehension was positively correlated with vocabulary, decoding, phonological awareness, and morphological awareness in this study. Both qualitative and quantitative data indicated that this group of adults used a wide variety of materials and strategies for reading.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

The World Health Organization estimated that by the year 2025, the population of

persons over the age of 60 would number 806 million or nearly 12 percent of the world's

total population (WHO, 2001). In the year 2000, an estimated 13% of the U. S.

population was 65 or older. Between the years 2010 and 2030, as the baby boom

generation reaches age 65, the number of Americans over the age of 65 will double

compared to the year 2000, with people over the age of 65 making up approximately 20%

of the U.S. population (Administration on Aging, 2002).

As would be expected, age alone is not a factor that distinguishes groups of

individuals in terms of successful aging. Studies have focused primarily on physical

health or illness in an effort to determine what characterizes individuals who were aging

successfully (Garfein & Herzog, 1995; Herzog, Kahn, Morgan, Jackson, & Antonucci,

1989; Roos & Havens, 1991). The factors that have been found to distinguish these

individuals from others include frequency of talking on the phone, number of days

confined to bed, number of mental health visits in the recent past, number of stressful life

events (such as death of a spouse) over a three year period, and religious participation

(Herzog et al., 1989). Of particular interest from this study was the inclusion of reading

religious material as demonstration of active "religious participation" and that this type of

reading was found to be a significant predictor of positive aging. This description

suggested the perception that reading can be a form of active participation.

One common definition of successful aging has been the ability to maintain

independence. While remaining independent has been associated with higher scores on

life satisfaction indexes, it is not necessarily a linear relationship (Roos & Havens, 1991).

It is difficult to make generalizations about independence and function because older

adults were by nature a heterogeneous population. It is true, however, that those who

remain independent make fewer demands on the healthcare system (Roos & Havens,

1991) thus making independence an important goal in times of declining healthcare

reimbursement.

The World Health Organization published new definitions in 2001 for the

International Classification of Functioning, Disability and Health (ICF) with the intent to

compliment the traditional International Classification of Diseases and Related Health

Problems (ICD) system. The new ICF is structured around two broad components: (1)

body functions and structure and (2) activities and participation. The goal of the new

system is to provide a more complete description of the individual in relation to his or her

world. While the ICD system classified disease processes, it seems obvious that the

classification of the disease alone would not necessarily be sufficient on its own to

predict an individual's level of function. The ICF system provides a considerable advance

in this area. It reflects a major shift from identification of impairments and limitations to

a more inclusive description of the individual's structure, function, activities, and

participation.

The shift in focus from an illness driven model to a wellness driven model has

resulted in increased attention to setting goals that result in "functional" gain for each

individual. The American Speech-Language Hearing Association (ASHA) defined

functional communication as "the ability to receive or to convey a message, regardless of

the mode, to communicate effectively and independently in a given environment"
(Frattali, Thompson, Holland, Wohl, & Ferketic, 1995, p.12).

The term functional communication is sometimes used synonymously with "basic communication skills" which includes the ability to communicate concerns about basic physical needs (Elman & Bernstein-Ellis, 1995). If functional is synonymous with basic skills, the basic skills related to reading and writing should typically be acquired by the time an individual finishes the first grade (Hirsch, 1991). Most adults would not be satisfied with skills at this level. Additionally, the term "functional literacy" has been used to describe the ability to perform tasks thought to be required of adults in everyday living situations (Frattali, 1998; Holland, Frattali, & Fromm, 1999). Kirsch and Guthrie (1978) defined functional literacy as "reading to obtain, retain, or maximize an end or goal which has survival value" (p. 490). According to the WHO (2001), functional reading is defined as "comprehending the literal and implied meanings of messages that are conveyed through written language (including Braille), such as following political events in the daily newspaper or understanding the intent of religious scripture" (p. 325). This definition certainly describes more complex skills than the first grade reading level often noted as "functional" in many contexts.

Because older adults who remain independent utilize fewer healthcare resources and thus put less strain on the healthcare system, rehabilitation professionals are finding themselves under increasing pressure to work on skills that keep older adults "functional" in society. One underlying difficulty with this premise is that, as this aging population remains more active and stays in the workforce longer, the needs and desires of this population also are changing.

Literacy demands for older Americans are at an all time high as the aging population confronts new technology, increasing opportunities for education, increasing availability of healthcare information, and increasingly complex personal finance management systems (Harris, Rogers, & Qualls, 1998). In 2001, 4.3 million Americans (13 percent) age 65 and older remain a part of the U.S. labor force (Administration on Aging, 2002). This trend for older adults to stay active and remain in the work force longer contributes to their need and desire to maintain functional literacy skills. As the population ages, there is a need to recognize the changing literacy demands on older Americans.

In keeping with the intention of the WHO shift to more descriptive categories of function, clinicians, too, must shift their view from the traditional clinical evaluation, which focuses on deficits, to a more functional evaluation protocol that focuses on what the individual is able to do (Rao, 1997). General functional assessment tools are widely available and include such instruments as the Patient Evaluation and Conference System (Harvey & Jellinek, 1979), the Rehabilitation Institute of Chicago Functional Assessment Scale (Cichowski, 1995), and the Functional Independence Measure (State University of New York at Buffalo Research Foundation, 1993). Specific to communication, several functional measures have been developed and are widely used currently. These include such measures as the Functional Communication Profile (Sarno, 1969), the Communicative Abilities of Daily Living, Second Edition (Holland et al., 1999), the American Speech Language Hearing Association Functional Assessment of Communication Skills for Adults (Frattali et al., 1995), the Communicative Effectiveness Index (Lomas et al., 1989), the Revised Edinburg Functional Communication Profile

(Wirz, Skinner, & Dean, 1990) and the Communication Profile: A Functional Skills Survey (Payne, 1994). These tools include a wide variety of literacy tasks at varying levels of difficulty from simple single word reading and writing items to complex reading and writing tasks such as filling out forms and paying bills. While most functional instruments include calculation and writing as part of literacy tasks, Kirsch & Guthrie (1978) suggested the need to separate "functional literacy" skills, such as reading, from "cognitive competency" skills, such as listening, calculating, and writing. If clinicians are to set goals that are functional for the individuals they serve, they must have a general framework from which to guide the goal setting process.

Literacy skills are considered by most rehabilitation professionals to be instrumental activities of daily living, or IADLs. Literacy involves a complex set of tasks which are interrelated and include materials from a variety of genres (Reder, 1994). Print related materials cross almost all aspects of daily life from warning signs, to menu reading, to medication instructions. Literacy is not only important to individual daily function but also is part of the social and cultural practice of individuals within their community. Literacy skills are affected by individual competency and also by such factors as the individual's social network. Values and meanings attached to the use of printed materials are passed on through generations within cultural groups (Reder, 1994). Functional treatment plans should be directed toward skills which are "relevant to the circumstances and needs of an individual patient" (Elman & Bernstein-Ellis, 1995). Before clinicians can begin to address the functional literacy needs of older adults, they must first know what older adults without neurological deficits read and what types of strategies they use for reading.

In the early 21st century, the American population is aging and older adults are remaining active longer. Along with these changes, the pressure for clinicians to select "functional" materials and strategies is increasing. It is crucial that clinicians have information regarding the needs and desires of this population related to literacy activities. The purpose of the present study was to gather information regarding the reading and reading related skills of typically aging older adults.

CHAPTER II

REVIEW OF THE LITERATURE

To effectively review information that had been gathered regarding reading and reading related strategies in older adults, the review of the literature was approached from two perspectives. The first area is an overview of the materials and strategies that older adults use for reading. The second section includes a discussion of the underlying issues related to reading and reading related skills of older adults. For the purposes of this study, typically aging adults were defined as those adults over the age of 65 who were community dwelling, had adequate hearing and visual acuity to perform the tasks, and did not have history of neurologic disease or incidents.

Reading in Older Adults

Cohort Data

Information related to reading habits of typically aging older adults is limited in part because older adults are such a diverse group, and in part because these data are somewhat difficult to collect. While many different strategies have been previously employed to examine reading, it remains difficult to summarize the reading and writing activities of "typical" older adults. Social and historic events affect behavior in daily life and thus some attention must be given to cohort effects on reading habits. An age cohort is defined as a group of people born at roughly the same time who share common experiences such as cultural and historical events (Spirduso, 1995). Gerontologists sometimes used the term "social convoy" to describe the coalescence of these cohort groups as they traveled through life. While they are members of cohort groups, within those groups there are likely to be persons who have a variety of physical and mental

conditions which predispose them to various levels of function (Garfein & Herzog, 1995; Roos & Havens, 1991). Even within a literate society, there are considerable differences in exposure to print. Likewise, among persons of comparable reading skill, there are considerable differences in print related activity (Stanovich & Cunningham, 1992).

Previous research includes primarily self-reported information; however, there is inherent difficulty with reliability of these data. A variety of questionnaire, diary, and interview strategies have been used to assess older adults' reading preferences and habits. Using these strategies, social desirability confounds are noted frequently (Guthrie, Seifert, & Kirsch, 1986; Rice, 1986b; West, Stanovich, & Mitchell, 1993). It is not uncommon for adults, particularly educated adults, to inflate self-reported reading activities whether consciously or not because reading is thought to be a socially valued activity (Stanovich & Cunningham, 1992). This often inflated report may actually reflect these individuals' perception of themselves as readers rather than their typical reading behavior (Guthrie et al., 1986). Some increase in reliability has been described when using activity record or diary format; however, it has been noted that this format requires considerably more commitment on the part of the participants who must make entries in the record. It should be noted, however, that social desirability confounds have been reported with these collection strategies as well (West et al., 1993).

Many studies have found that newspaper reading is the most common literacy activity of adults (Guthrie & Seifert, 1983; Kirsch & Guthrie, 1978; Robinson, 1980; Sharon, 1973; Smith, 1996). It is estimated that more than 50% of adults read periodicals such as the newspaper and magazines (Sharon, 1973; Smith, 1996; West et al., 1993). The oldest groups (age 65 and older) demonstrate more extensive newspaper reading

(Smith, 1996). Newspaper reading and book/magazine/other reading are significantly and positively correlated with available "free" time and are considered to be largely the result of personal preference or habit (Rice, 1986a, 1986b; Robinson, 1980).

National Survey Data

The National Center for Education Statistics has conducted assessments of adult literacy in the United States regularly since the mid 1980s. The National Adult Literacy Survey (NALS, 1992) defined literacy as "using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential" (Sum, 1999, p. 2). The most recent survey of adult literacy in the United States, the National Assessment of Adult Literacy (2003), continued to use the same working definition. The results of the 2003 NAAL will not be published until May of 2005, but results of the 1992 NALS warrant discussion. The 1992 NALS included approximately 26,000 participants across the United States and assessed literacy in the areas of reading prose, reading documents, and quantitative literacy. Each of these areas was assessed using simulated everyday tasks such as understanding a newspaper article or filling out a form or questionnaire. The tasks were assigned a level of proficiency based on a five point scale ranging from "basic proficiency," such as signing one's own name, to "higher function" (e.g., calculating interest on a loan). The results indicated that roughly half of the participant group performed in the two lowest levels of literacy function (Sum, 1999). These results were of significant concern because they implied that even successfully aging older adults could have difficulty with functional literacy tasks related to health information such as comprehending informed consent materials (Brez & Taylor, 1997).

Sharon (1973) used an interview format to examine the role of reading in the everyday lives of American adults. A survey regarding activities from the previous day was conducted with 5,067 persons over the age of 16 from across the nation. The interviewer recorded each activity that involved reading. The interviewers prompted the participants to describe where and why the reading was done, how long the participants spent in the reading activity, how important they thought the activity was, and whether the participants found the information to be difficult to understand. If no reading was mentioned, the interviewer prompted participants to remember any reading they may have done in the course of their other daily activities. In their sample, they found that the average adult read 1 hour and 46 minutes per day.

On a somewhat smaller scale, McEvoy and Vincent (1980) also used an interview format with 1,450 adults and found 6% to be "nonreaders" (i.e., persons who had not read any books, newspapers, or magazines in the past six months). The oldest group in this study (age 65 years and older) accounted for the highest percentage of nonreaders. This was attributed to their general lack of education as a group. It should be noted that the educational level of older Americans has increased considerably since 1980. Between 1970 and 2001, the percentage of adults age 65 and older who have completed high school has risen from 28% to 70%. In 2002, an estimated 35% of older adults had some college education and 17% had a bachelor's degree or higher (U. S. Census Bureau, 2002).

Employment Demands for Literacy

Employment status and type of employment also has been associated with literacy levels (Smith & Reder, 1998). Literacy skills are higher on average for those older

persons who either are employed or are active volunteers. Likewise, persons who have

recently performed volunteer work and those who have voted in the most recent state or

national election exceed the performance of those who do not, regardless of age (National

Center for Education Statistics, 1999). While there seems to be a generally inverse

relationship between level of activity and cognitive decline, it is impossible to determine

the direction of the relationship (Salthouse, Berish, & Miles, 2002). Other studies

(Hultsch, Hammer, & Small, 1993; Perlmutter & Nyquist, 1990) that demonstrated a

relationship between self-reported health status and cognitive performance also have been

unable to demonstrate the direction of the relationship.

Hultsch and his colleagues (1993) supported the notion that health effects were

related to basic processing skills but not necessarily to knowledge-based tasks

(crystallized intelligence). In this study of 484 men and women aged 55 to 86 years,

participants completed a battery of cognitive tasks including measures of vocabulary,

verbal fluency, word recall, and text recall. Results showed that maintaining a self-

reported active life style was related to better performance on cognitive tasks. Because

their sample was healthy and active by their own report, the authors suggested that the

difference might possibly be even greater if a more diverse activity level group had been

included in the study. Salthouse, Kausler, and Saults (1990) examined data from 362

adults aged 20 to 79 years and found no relationship between self rated health status and

cognition. The authors indicated concern regarding the issues of volunteer self selection,

assuming that persons who volunteer were likely in better health than the general

population. Likewise, the authors acknowledged that very few of the young adults in their

study reported medical problems, making it difficult to compare self reported health

status across this sample. Some researchers have demonstrated self-reported health status to be highly correlated with cognitive performance (Emery, 1985; Hultsch et al., 1993) although these researchers have acknowledged the likelihood of volunteer bias.

Exposure to Print

West, Stanovich, and Mitchell (1993) attempted to measure exposure to print while controlling for potential social desirability confounds. They used an interesting, if somewhat unconventional, approach to recruiting participants. The investigators observed people reading in the waiting area of a major airline in a large metropolitan airport and approached 217 individuals who were designated either as "readers" or "nonreaders." For the purpose of this study, they identified "readers" as persons who participated in obviously recreational reading for ten continuous minutes. "Nonreaders" were defined as persons who did not engage in reading for a period of ten consecutive minutes and had no reading material around them that was observable by the experimenter. The investigators designed tasks that attempted to determine level of print exposure across a variety of genres. The tasks included a series of checklists such as the Author Recognition Test, the Magazine Recognition Test, newspaper recognition checklist, television program recognition, television name recognition, film recognition, cultural literacy, and vocabulary checklists. All measures were shown to have adequate reliability. Readers scored significantly higher than nonreaders on the print exposure tasks, vocabulary, and cultural literacy tasks. Reading also was correlated with age and level of education, with readers being generally older and more highly educated than nonreaders. It should be noted, however, that the airport sample had a much smaller number of participants over the age of 65 than in any other age groups.

Rice (1986a; 1986b) used "anthropological methods" to assess the everyday activities of older persons. Because of concern that a questionnaire might impose categories on the participants, a structured one page diary form was used in an effort to avoid examiner bias. The author also suggested that the diary format provided anonymity for the participants where an interview format would not and therefore that the information obtained would be less affected by social desirability. The diary form was divided into one hour blocks and participants were instructed to list the activities they engaged in during each block. In addition, participants were asked to list specific items read during the day including a description of the material, the length of time spent reading, and a comment about why the material was read. Data were kept regarding degree of interest in the materials read, as well as the participant's rating of the level of difficulty of each item read. Participants also were instructed to record any writing that they did during the day. Diaries were kept on a weekly basis every other week until data for five weeks were obtained. Participants were 54 adults divided equally into age categories of young (18-32 years), middle (40-54 years), and old (62 years and older). Results indicated that differences in reading behavior were more related to differing daily requirements of different age groups (whether the individual was a student, was working, or was primarily home-bound) rather than to age or vocabulary skills (Rice, 1986a, 1986b).

Attitudes About Reading

Reading for recreation and reading for knowledge are generally considered to be the two main purposes of reading (McEvoy & Vincent, 1980). Older adults with high verbal scores are more likely to describe reading as pleasurable, a favorite activity that

they pursue daily for several hours (Rice & Meyer, 1985). An assessment of leisure activity in retirees found that most persons demonstrated little change in the type of activities they participated in pre- and post-retirement, but that the majority of individuals participated in more activities after retirement than they did before (Peppers, 1976). Some 65.5% of retirees sampled reported reading as a significant leisure activity in retirement.

It is interesting to note that while reading often is listed as a significant leisure activity in retirement, and the amount of time spent reading the newspaper increases significantly with age, reading of other types of print material decreases with age (Rice, 1986a, 1986b). Although reading is a significant leisure activity, most findings indicate that adults spend, on average, less than two hours per day reading (Rice & Meyer, 1985, 1986). Results of Sharon's (1973) study indicated that the average adult spent 1 hour and 46 minutes per day reading (which included 35 minutes reading the newspaper) with young adults and males spending slightly more time reading than older adults or females. In the Sharon (1973) study, adults over the age of 65 spent the least time reading (an average of 89 minutes per day).

Reading Materials

One of the difficulties with research on reading comprehension in the elderly is the concern that standard recall and recognition type tasks are not "ordinary" daily activities for older adults. Shadden (1997) described minimal change in problem solving skills with advanced age as long as the participants viewed the problems as "real life" situations. Some authors (Rice & Meyer, 1985; Shadden, 1997) have suggested that older adults are less motivated to perform well on seemingly meaningless tasks and therefore show performance decrements greater than they may be actually. Most older adults who

participate in research are "volunteers," however, which would intuitively suggest that they are motivated to demonstrate their abilities.

Reading a daily newspaper or novel does not require the same kinds of skills as reading for retention or recall; therefore younger adults who are more likely to be students would be expected to spend more time practicing these types of skills (Rice & Meyer, 1985). Meyer (1987) indicated that some of the age related deficits she identified were due to older adults' inability to use effective recall strategies in addition to their unfamiliarity with the task. She described a training program designed to teach older adults to use the organization of the text to guide their comprehension and recall of material. The results indicated that if adults used strategies, such as identifying the organization of the text, their comprehension and recall improved. Meyer also found that prior knowledge facilitated recall in all age groups, although older and younger participants used their prior knowledge in slightly different ways. If reading was self paced, older adults were able to recall more information after reading a passage than they were when the passage was presented aloud; there was no difference between modes of presentation for younger participants (Meyer, 1987).

Use of text cues and other strategies for improving comprehension are less efficient in older readers. In a study comparing 20 young adults aged 19-33 years and 20 older adults aged 62-81, Zabrucky and Moore (1994) examined the strategies used for comprehension and recall of paragraph length reading material. When presented with text which included inconsistent information, younger participants were more likely to selectively reread particular passages, while older participants demonstrated less efficient strategies and had a tendency to re-read the entire text. The results of this study indicated

that older adults were aware of comprehension problems but were not as efficient or effective in the use of strategies such as selective rereading to clarify information.

An interesting note about the study by Zabrucky and Moore (1994) was that they presented the text on a computer screen, which allowed them to assess the number of times each individual read and reread a particular passage. This presentation format was of concern because of the potential confounds of an unfamiliar presentation format for the older group. However, no difference was identified in the older adults' performance when passages were presented via computer screen or in traditional hardcopy paper form (Moore & Zabrucky, 1995; Zabrucky & Moore, 1994). In general, all participants spent more time reading on the computer screen but time did not account for differences in performance between age groups. Overall reading time for the older participant group was slightly longer but was not statistically significant. The on-line administration procedure influenced both young and old participants in a positive way, producing better recall of information, better recall of problematic information, and increased report of text inconsistencies.

Reading time also has been found to be a significant predictor of performance when older adult participants demonstrate poor recall from text (Hartley, 1986). Increased reading time, reflected as reduced reading rate, is thought to be a compensatory strategy for older adults who suffer from a decline in working memory. Rice & Meyer (1985) and Meyer (1987) examined strategies such as reduced reading rate and identification of the organization of the reading material and found that these strategies improved recall. Likewise, Zabrucky and Moore (1994) examined re-reading and selective re-reading as strategies for increasing comprehension. In both examples,

however, the strategies were predetermined by the researchers and may or may not have been strategies that the participants would have identified as the strategies they most frequently used

Differences in the content of various types of texts also have been considered in terms of the likely impact on recall of information. Text genre, whether expository, narrative, or procedural in nature, is a better predictor of performance than age alone (Harris et al., 1998). Yussen and Glysch (1993) found that across several age ranges, good organization of the reading material gave participants a considerable advantage in initial learning of the material, although delayed recall of the information after one week was not affected.

<center>Aging Influences on Reading</center>

Hearing and Vision

Advancing age has been shown to result in decline in auditory and visual acuity, beginning in the fourth decade of life (Willott, 1991). Older adults demonstrate difficulty in detecting low intensity sounds, discriminating slight changes in pitch or loudness, localizing sound sources, and filtering noise in the environment (Schneider & Pichora-Fuller, 2000). In addition to simple visual acuity, aging also results in declines in contrast sensitivity, slower adaptation, and reduction in visual field which also may cause the older adult to have difficulty with processing of visual stimulation (Scialfa et al., 1988) Research indicates that the connection between sensory function and cognition are apparent across the life span but become much more pronounced with advancing age (Baltes & Lindenberger, 1997; Lindenberger & Baltes, 1994). It has been suggested that

health may be a contributing factor to cognitive decline, but is likely not the primary determinant in most cases (Craik, Anderson, Kerr, & Li, 1995).

Cognition

Any discussion of the likely changes in reading and writing skills with advanced age also must consider the general cognitive changes pervasive among older adults. Older adults may perform as well as younger in terms of various attention tasks, although the older adults' performance is typically slower. Also, older adults demonstrate slower overall reaction times. There is a great degree of variation in older adults' compensation for these perceptual deficits, again contributing to the difficulty in drawing conclusions about "normal" aging (Baltes & Lindenberger, 1997; Schneider & Pichora-Fuller, 2000). Other issues that impact cognitive performance include educational and occupational experience, motivation, and general health.

With advancing age, performance on immediate recall tasks requiring recall of a short list of items declines very little. If the items must be held and manipulated or combined with additional information, however, significant decline has been seen with age (Craik et al., 1995). In long term memory tasks, older adults show performance decrements if the tasks are not paired with or supported in some way by motor tasks at the time of learning or with cued recognition upon retrieval. Older adults are more likely to decline in memory of spatial or temporal details such as where and when an event occurred. Prospective memory, or the ability to carry out a future event, is well maintained in older adults possibly because they have established strategies such as taking notes or setting up a reminder system. Semantic memory, including the retrieval of proper names, clearly declines with age. In contrast, implicit memory involving the

18

unconscious effect of past knowledge on present performance and metamemory, or the

ability to assess one's own memory skills, is relatively well preserved in advanced aging

(Craik et al., 1995). Older adults show slower and less accurate responses after a delay,

thus are more likely to show a decline in the ability to retain details over time (Belmore,

1981).

Memory

The most striking issue of deterioration in cognitive function with advancing age

reported widely in the literature is the decline in working memory (Kemper, Kynette,

Rash, O'Brien, & Sprott, 1989; Kemper, Rash, Kynette, & Norman, 1990; Kynette &

Kemper, 1986; Schneider & Pichora-Fuller, 2000). Working memory is described as a

limited capacity system used for holding material, often multiple bits of information,

while the material is manipulated in some way or combined with additional incoming

material (Craik et al., 1995). There seems to be some general agreement that there is a

decline in discourse comprehension when tasks become more complex secondary to

decline in working memory with advanced age. The findings of many studies support the

notion that decline in working memory affects reading comprehension with advancing

age (Kemper et al., 1989; Norman, Kemper, & Kynette, 1992; Zabrucky & Moore, 1994).

It has been suggested that decrements in auditory and visual input also may tax

the working memory system (Schneider & Pichora-Fuller, 2000). Some researchers

believe that older adults do not demonstrate significant decline in language function

simply as a result of years of practice and use of language skills. The relationship

between reading practice and recall remains unclear, although it appears that a certain

level of skill is necessary before practice is effective (Meyer, Young, & Bartlett, 1993).

While a decrease in the amount of information that older participants are able to recall

has been demonstrated, verbal ability has been shown to be a better predictor than age

(Meyer, Young, & Bartlett, 1989; Rice & Meyer, 1986). Similarly, recall performance

has been shown to be comparable in young adults and highly verbal older adults, but

older adults with average vocabulary skills show significant deficits in measures of prose

recall when compared to younger adults of similar ability (Rice & Meyer, 1985). Greater

prose recall in older adults is associated with higher level of education, higher vocabulary

scores, more prior knowledge of the topic, slow or self paced presentation, and more time

spent reading every day (Meyer et al., 1993). One study of interest (Hartley, 1986)

showed that vocabulary was only weakly related to recall and that the amount of time

individuals reported they spent reading on average was the best predictor of performance

on a prose recall task. In general, age differences in reading abilities seem to be

attenuated in older persons with superior semantic abilities (Meyer et al., 1993).

Older adults demonstrate a decline in ability to summarize information, describe

themes, or describe morals with advanced age (Glosser & Deser, 1992). In contrast, older

adults show little decline in attention or memory if tasks are simple, there is no

competing stimuli, information is brief or personally relevant, there are no time

constraints, and there is redundancy in the information presented (Shadden, 1997).

Additionally, older adults have been shown to learn complex tasks more slowly, but

retain information well once learned. Older adults also have been shown to perform as

well as younger adults in their ability to recall the basic points of a story, but age

decrement has been noted when results are analyzed for ability to recall fine details

(Obler, Au, & Albert, 1995). Because memory for overlearned material remains

relatively intact, it stands to reason that older persons with specific expertise in some area

will remain skilled in tasks related to their prior knowledge.

Phonological and Morphological Awareness

Areas which have been widely studied in regard to children's reading and spelling

development are phonemic awareness, morphological awareness, and metacognition.

These areas have not been investigated as well with regard to their effect on the reading

and spelling of older adults. It is believed that adults and children do not differ, however,

in the strategies that they use to read sight words and nonwords. Adults who report

having difficulty reading have been shown to have poorer performance in sound

segmenting and nonword reading tasks than children of comparable reading skill level

(Greenberg, Ehri, & Perin, 1997). Poor readers in all age groups have been shown to have

decreased awareness of phonemic structures independent of their nonverbal IQ scores.

There appears to be a strong relationship between phonological awareness and reading

ability in both children and adults (Greenberg et al., 1997; Pratt & Brady, 1988).

Participants' self-rating of spelling has been shown to be statistically correlated

with spelling on some experimental measures. In a study by MacKay and Abrams (1998)

both older (age 63-71years) and oldest (age 73-88 years) groups of adult participants

made more spelling errors than young adults (age 17-23 years) on high frequency and

low frequency words. Interestingly, only the oldest group was aware of a decline in their

spelling ability. Self-reported metacomprehension knowledge is a reliable predictor of

reading comprehension and adults appear to be somewhat better able to judge their own

memory skills than their comprehension skills (Lin, Moore, & Zabrucky, 2000; Smith,

1993). Adult readers acknowledge that increased effort is required to understand and

remember difficult texts but this knowledge alone does not result in improved performance on comprehension tasks.

Morphological awareness also is related to reading and spelling (Shankweiler, Lundquist, Dreyer, & Dickinson, 1996). Although some authors theorize that morphological awareness is an extension of phonemic awareness, morphological awareness has been shown to have increased importance in reading comprehension (Deacon & Kirby, 2004; Nagy, Berninger, Abbott, Vaughan, & Vermeulen, 2003). Printed word recognition requires both semantic and orthographic input and speed of recognition is likely a function of exposure, with related words linked within the lexicon so that access to one word in the word family partially activates other members of the word family (Carlisle, 2003; Chialant & Caramazza, 1995; Nagy, Anderson, Schommer, Scott, & Stallman, 1989; Napps, 1989).

Purpose of the Study

The purpose of this study was to gather information related to reading abilities in typically aging older adults. A variety of strategies have been used in the past to assess reading in older adults. These strategies included the use of questionnaires, diary keeping, and interviewing. Several weaknesses in previous research were noted including lack of diversity in samples, volunteer bias, and social desirability confounds. More importantly, however, none of the previous research examined the scope of components that affect reading and reading-related skills in typically aging adults.

The following research questions were addressed:

1. What are the reading and reading related abilities of older adults and how are these findings correlated?

2. What is the level of awareness that older adults have regarding strategies used to improve reading comprehension?

3. What types of materials and with what frequency do older adults read and how are these findings correlated with reading comprehension?

CHAPTER III

METHOD

Participants

One hundred and one potential participants, 74 female and 27 male, between the

ages of 65 years 0 months and 79 years 11 months were recruited for this study from area

agencies including the Center for Health and Wellness, Hunter Health Clinic, Senior

Services of Wichita, Inc., East Wichita Shepherd Centers, local assisted living facilities,

and community/church groups. Prior to the collection of data, participants completed the

informed consent form (Appendix A).

Five participants were excluded from the data analysis secondary to self-reported

history of neurologic incident or disease. The mean age of the remaining 96 participants

was 72 years 5 months, with a standard deviation of 4.19 years. The ethnicity of this

sample was 94.8% white, non-Hispanic, 4.2% African American, and 1% Asian/Pacific

Islander. The majority of participants (58.4%) had completed at least a Bachelor's level

of education with 29.2% of those having advanced degrees. An additional 29.2% had

completed some college level education. Nineteen percent of the sample indicated that

they were still working outside the home. Of those who were retired, the length of

retirement ranged from 4 months to 25 years ($M = 6.71$ years, $SD = 6.07$). Sixty-five

percent indicated they were active volunteers with the number of hours per week

volunteering ranging from 1 to 40 hours per week ($M = 4.14$ hours, $SD = 6.2$).

Because individuals with functional corrected vision were included in the study,

vision was screened with correction (if needed) using a portable Snellen chart. The chart

was equipped with a calibration measure to ensure consistency in distance to print. All

participants were able to read the chart at least at the 20/125 level and thus were considered to have adequate visual acuity to read test protocol material that was printed in Times New Roman 16 point font.

Functional hearing was defined as hearing acuity adequate to hear the stimulus with amplification as needed. The hearing screening was based on a self-selected comfortable loudness level. Each participant listened to ten Spondee words initially presented at 65 dB SPL (as measured by Radio Shack digital sound level meter) on a Panasonic model RX-D29 portable CD player. While listening, participants were instructed to adjust the volume to a listening level that was "comfortable." Ten additional Spondee words were presented at that level. All participants were able to repeat the ten additional words with 100% accuracy. The remaining test protocol auditory stimulus items were presented at each participant's "comfortable" loudness level.

Participants completed a questionnaire which included such demographic information as age, level of education, occupation, and activity level. They also were asked to complete the Composite Physical Function Scale (CPFS) (Rikli & Jones, 1998) a scale designed to assess a wide range of functional abilities. Participants rated themselves using a three point scale indicating "cannot do," "can do with difficulty or with help," and "can do." The twelve items on the CPFS ranged from basic activities of daily living through instrumental activities of daily living and advanced activities such as strenuous exercise. The CPFS has been shown to be both reliable and valid (Rikli & Jones, 1998).

Procedures

Testing was completed over a ten week period. Data were collected either at the Wichita State University Speech-Language-Hearing Clinic, or in a quiet room in the participant's home.

All stimuli presented auditorally were recorded using a Marantz PMD670 portable solid state digital recorder. The audio recordings were uploaded to a Macintosh eMac Power PC G4 computer and edited using the Amadeus II sound editor program. The stimuli then were randomized and burned to compact discs.

Test protocol measures included both standardized and non-standardized assessment tools. The standardized measures were subtests of instruments that have normative data applicable to the target age group. The informal instruments were either originally designed for use with adults, or were slightly modified to reflect more adult level vocabulary. The order in which the tasks in the protocol were presented to each participant was randomized using a random numbers table (source: www.random.org) to eliminate concerns regarding order effect and/or fatigue. The two qualitative questions were always asked at the conclusion of the protocol.

In this study, five tasks were used to answer the question related to reading and reading related abilities of older adults. Two tasks were used to answer the question related to awareness of strategies used to improve reading comprehension. Three additional survey type measures were used to determine the types of materials and with what frequency older adults read.

A pilot study was conducted with three older adult participants ($M = 62$ years 8 months, $SD = 2$ years 0 months) to determine the appropriateness of the procedures to be

used in this study. The pilot participants provided valuable feedback to the investigator regarding the timing of stimulus items on recorded tasks and clarity of instructions provided for the various tasks. Following the pilot study, the Test of Morphological Structure (TMS) and the Comes From Task (CFT) were both shortened to 20 items preserving the ratio of types of morphological change within each task. The response delay on the TMS task also was shortened from five seconds to three seconds as a result of feedback from the pilot study participants.

<center>*Reading and Reading Related Abilities of Older Adults*</center>

Reading Comprehension

Participants read two passages from the Qualitative Reading Inventory – 3 (QRI-3) (Leslie & Caldwell, 2001). This inventory has been shown to be both valid and reliable (Leslie & Caldwell, 2001). One of the passages was a narrative text entitled "Andrew Carnegie" which was 264 words in length and had a Flesch-Kincaid grade level of 8.1 (Flesch, 1951). The Flesch-Kincaid index was used as a rough measure of the year in school at which the text reader might understand the content. The Standard Error of Measure for the narrative text was 0.17. The other passage was an expository text entitled "Ultrasound" which was 243 words in length and had a Flesch-Kincaid grade level of 8.0. The Standard Error of Measure for the expository text was 0.16. Each passage was followed by a set of eight recall questions. Question sets included four explicit and four implicit questions. Scores were reported as the proportion of correct responses per passage.

Decoding

The Word Attack and Word Identification subtests of the Woodcock Reading Mastery Tests-Revised (Woodcock, 1998) were designed to measure decoding skills. The Word Identification subtest required the individual to produce "a natural reading" of a given word regardless of his/her knowledge of the meaning of the word. The Word Attack subtest required the individual to read nonsense words or words which have very low frequency of occurrence by applying his/her knowledge of phonics. Normative data for adults aged 20 to 80+ were available for this test. The Standard Error of Measure was 3 for the Word Identification subtest and between 2 and 3 for the Word Attack subtest. For these subtests, the normed mean was set at 100 with a standard deviation of 15 for this age group. Standard scores were reported.

Reading Vocabulary

The Vocabulary subtest of the Nelson-Denny Reading Test Form G (Brown, Fishco, & Hanna, 1993) was used as a measure of reading vocabulary. The vocabulary subtest was timed. Participants were allowed 15 minutes to respond to multiple choice items describing the meaning of a given word. Normative data from four geographic regions totaling more than 10,000 participants were provided for this test. The Standard Error of Measure for the vocabulary subtest was between 3.25 and 3.77 for the adult samples. There are 80 items on this subtest and scores were recorded as scaled scores. Normalized scale scores for this measure had a mean of 200 with a standard deviation of 25 for this age group.

Phonological and Morphological Awareness

To assess phonological awareness, two non-standardized measures designed by Moran and Fitch (2001) were used (Appendixes B and C). In the first task, Phoneme Switching, participants were instructed to listen to the stimuli (two words, where the initial sound of each word is reversed) then state the target phrase (e.g., for "dasta pish" the participant should say "pasta dish"). Participants were allowed seven seconds in which to provide their verbal response on this task. The second phonological awareness task, Phonetic Reversal, consisted of words that, when pronounced backwards, made a different word. Participants were instructed to listen to the stimulus and then state the correct word (e.g., "kiss" backwards is "sick"). Participants were allowed three seconds to provide their verbal response on this task. The total number correct out of a possible 20 for each of the two tasks was recorded.

Morphological awareness is the ability to think about and use knowledge of word meanings to spell and comprehend words. The Test of Morphological Structure (Carlisle, 2000), a non-standardized measure, was designed to assess awareness of base and derived forms of words. Participants were presented with a target baseword followed by an incomplete sentence. They were instructed to use a derived form of the base word to complete the sentence. Participants were allowed three seconds to respond before the next recorded stimulus was presented. The original measure was shortened to 20 items and included four items with only orthographic changes (e.g., rely/reliable), five items with only phonological changes (e.g., major/majority), six items with both orthographic and phonological changes (e.g., reduce/reduction), and five items with neither orthographic nor phonological changes (e.g., enjoy/enjoyment) (Appendix D). Two

practice items were presented. (e.g., magic, He is a wonderful _____). Scores were reported as the number of acceptable responses out of a possible 20.

A second morphological task, the "Comes From Task" (Katz, 2004; Nagy et al., 2003), a non-standardized measure, was designed to assess relational knowledge. The original task was shortened to 20 word pairs that included five each of only orthographic changes, only phonological changes, both orthographic and phonological changes, or neither orthographic nor phonological changes from the base word to the target (Appendix E). Participants were instructed to look at the words and decide whether the first word in the pair came from the second word. Four practice items were presented ("Think about the words teacher and teach. It makes sense to say that teacher comes from teach because the two words are related in meaning. Now think about single and sing. It does not make sense to say that single comes from sing because the two words are not related in meaning even though they are similar in spelling."). Scores were reported as the number correct out of 20.

Awareness of Strategies for Improving Reading Comprehension

Two measures were administered to assess self-reported and demonstrated reading strategies. An adapted version of the Reading Strategy Awareness Inventory (Miholic, 1994) was used to assess participants' perception of their use of various strategies for improved reading comprehension. This inventory was modified slightly to include more adult vocabulary (Appendix F). Participants were instructed to mark all strategies that they believed they used. Additionally, they were instructed to prioritize the strategies if they felt that they used more than one strategy in a given situation. The inventory was "designed primarily to accentuate students' awareness" of reading

strategies (Miholic, 1994, p. 86); therefore, data obtained were descriptive in nature. The number of participants who indicated that they used the strategy was noted for each possible response.

Reading Fluency

Participants were asked to read aloud the Rainbow Passage (Fairbanks, 1960, p.127). This passage was designed to include phonemes in the proportion that they occur in the English language. The passage was 99 words in length and had a Flesch-Kincaid grade level of 6.7. Participants were instructed to read the passage aloud at a comfortable reading rate. A traditional miscue analysis (Nelson, 1994) was performed. As the participant read aloud, the examiner marked each instance of word or part word omission, substitution, insertion, repetition or regression, correction, dialect, or assistance. The score was reported as the number of correct words read aloud per minute. The incidence of each type of miscue was reported.

Frequency and Types of Reading Materials Used by Older Adults

Author Recognition

Participants were asked to complete three survey instruments designed to assess the frequency and types of material they regularly read. All participants completed the Author Recognition Test (ART) (West et al., 1993), a non-standardized measure designed to measure exposure to print. This test consisted of a list of 25 names (Appendix G). The list used in this study included 16 well known authors taken from the original ART list or from an October, 2004, New York Times Best Seller list as well as nine "foils." The foils were names taken from the American Speech-Language Hearing Association's (ASHA) publications board or office staff rosters. When the list was presented, the participants

were instructed to mark all the names they knew to be authors. Scoring on this task was completed by subtracting the proportion of foils marked from the proportion of correct items marked to reflect a score which provided correction for guessing.

Reading Habits

Participants completed a shortened version of the Reading Habits Survey (Harris et al., 1998) a non-standardized measure designed to assess the frequency of reading of various types of materials. Demographic information items as well as items related to children/child care were omitted from the original survey. Nine sections of the survey consisted of lists of various types of reading materials including both high information content materials (e.g., novels, textbooks books, and business letters) and low information content materials (e.g., environmental signs, clothing labels, and comics). The participant was instructed to report how often he/she read this type of material. Response options for these items were on a five point Likert type scale from "never" to "often." Total scores for each category of reading material as well as a total score for all materials were reported. Higher scores indicated higher frequency of reading in that category of material. Three questions related to frequency of buying or borrowing books and seven yes/no and short answer questions from the original survey were included to assess other indicators of reading habits such as "Do you belong to a book club?" and "How many books would you say are in your home?" Responses to these items were reported descriptively.

Reading Attitude

The Reading Attitude Scale (Estes, 1971), consisting of 15 items, was administered. The "try out" form of this measure demonstrated adequate reliability using

the split half method (t=4.06, p<.001). The original instrument was only slightly modified to reflect current colloquial and more adult level language (Appendix H). Items on this task required the participant to state his/her opinion about certain aspects of reading, (e.g., "Reading is for learning but not for enjoyment" or "Books make good presents"). Responses were recorded on a five point Likert type scale ranging from "strongly disagree" to "strongly agree." Values for the negative reading attitude items were recoded so that higher scores reflected more positive attitudes about reading.

Qualitative Analysis

In addition to the structured tasks previously described, at the end of each participant's session, the participant was asked two open-ended questions: "tell me about what you read", and "when you had to answer the questions about what you read, how did you do it?" Responses to the open-ended questions were examined by the primary investigator using a word count strategy, and several themes were identified. The responses then were reviewed and comments were categorized by each theme. A second independent reviewer followed the same procedure for all responses and results from the two were compared. Preliminary agreement between the raters was 97.6%. On the few points of disagreement, a consensus of opinion was reached through discussion with a third independent rater.

Data Analysis

Inter-scorer reliability for the reading comprehension, decoding, phonological awareness, morphological awareness, and reading fluency tasks were verified by having an independent judge re-score a random ten percent of the participants' responses for comparison to the original scoring. For this purpose, each

participant's verbal responses were recorded using a Marantz PMD670 portable solid state digital recorder. Ten percent of the participant files were selected using a random numbers table generated electronically (source: www.random.org). Inter-scorer reliability for these tasks was 97.5%.

Statistical analyses were conducted using SPSS 11.0 (2001). For the five tasks that were used to measure the reading and reading related abilities of older adults, several statistical analyses were conducted. Descriptive statistics including measures of frequency such as mean, standard deviation, and range were calculated. Subsequently, correlations were used to examine the relationship between reading comprehension and reading related skills such as decoding, phonological awareness, and morphological awareness. A paired samples t-test was conducted to examine the difference in participants' responses related to type of question asked (e.g., implicit or explicit).

For the two tasks designed to answer the question related to awareness of strategies used to improve reading comprehension, frequency counts were conducted. In addition, a Pearson correlation was calculated to examine the relationship between reading strategy awareness and reading comprehension. Descriptive statistics including measures of frequency were conducted for the three additional survey type measures used to determine the types of materials and with what frequency older adults read.

CHAPTER IV

RESULTS

The purpose of this study was to gather information related to reading abilities in typically aging older adults. The questions guiding this research addressed issues related to (1) the reading and related abilities of older adults, (2) the level of awareness that older adults have regarding strategies used to improve reading comprehension, and (3) the types and frequency of reading materials older adults use.

Reading and Reading Related Abilities of Older Adults

The tasks that were administered to determine the reading and reading related abilities of older adults included reading comprehension, decoding, reading vocabulary, phonological awareness, and morphological awareness. Descriptive statistics (i.e., means, standard deviations, and ranges) summarizing the data from 96 participants for each task are presented in Table 1. It should be noted that three participants inadvertently skipped a page of the reading vocabulary subtest of the Nelson-Denny Reading Test and therefore the results for that task represent data from 93 participants. Likewise, one participant failed to complete the Composite Physical Function Scale and another participant did not complete the phonetic reversal task and thus the results for those two tasks reflect data from 95 participants.

Table 1

Reading and Reading Related Abilities

Assessments	Type of Score	Maximum Possible Score	N	Range	Mean	SD
Reading Comprehension[1]						
Expository	Proportion Correct	1.00	96	.38-1.00	.90	.13
Narrative	Proportion Correct	1.00	96	.12-1.00	.68	.22
Implicit Questions	Raw	8	96	4-8	6.44	1.15
Explicit Questions	Raw	8	96	1-8	6.15	1.56
Decoding[2]						
Word Identification	Standard Scores (M=100, SD=15)	175	96	69-136	106.78	10.26
Word Attack	Standard Scores (M=100, SD=15)	175	96	70-125	102.27	11.02
Vocabulary[3]						
Reading Vocabulary	Normalized (M=200, SD=25)	258	93	165-258	241.98	18.96
Phonological Awareness						
Phoneme Switching	Raw	20	96	0-20	9.15	6.54
Phonetic Reversal	Raw	20	95	0-20	6.42	5.68
Composite	Raw	40	95	0-39	15.66	11.23
Morphological Awareness						
Morphological Structure	Raw	20	96	1-20	18.28	2.82
Come From Task	Raw	20	96	13-20	19.06	1.12
Composite	Raw	40	96	21-40	37.35	3.22

[1]Qualitative Reading Inventory—3
[2]Woodcock Reading Mastery Test
[3]Nelson-Denny Reading Test

Reading Comprehension

Mean proportion correct scores on the reading passages from the Qualitative Reading Inventory – 3 (Leslie & Caldwell, 2001) were calculated. Results for these participants were a mean proportion correct of .90 (SD = .13) for the expository passage and .68 (*SD* = .22) for the narrative passage. A paired-samples *t* test was conducted to evaluate the difference in mean proportion correct scores for the two passages. Results indicated that participants did perform significantly better on the expository passage, t(95) = 10.39, p<.01. The standardized effect size, *d*, was 1.06. A paired-samples *t* test was conducted to evaluate whether participants performed significantly better on implicit questions than explicit questions. Results indicated that the mean number correct for implicit questions (*M* = 6.44, *SD* = 1.15) was significantly greater than the mean number correct for explicit questions (*M* = 6.15, *SD* = 1.56), t(95) = 2.00, p<.05. The standardized effect size index, *d*, was .20.

Decoding

The mean score for this sample on the Word Identification subtest of the Woodcock Reading Mastery Test (Woodcock, 1998) was 106.78 with a standard deviation of 10.26. The mean score on the Word Attack subtest was 102.27 with a standard deviation of 11.02. The reported mean score for adults in this age range in the normative data for this test is 100 with a standard deviation of 15.

Reading Vocabulary

Scale scores on the Vocabulary subtest of the Nelson-Denny Reading Test (Brown et al., 1993) were normalized scores with a mean of 200 and standard deviation of 25. The normative sample for the Nelson-Denny Reading Test included students from

two-year colleges as well as four-year colleges and universities. Participants in this study demonstrated a mean of 241.98 with a standard deviation of 18.96.

Phonological Awareness

Data for the two tasks, phoneme switching and phonetic reversal, were initially examined independently. The mean for the participants on the phoneme switching task was 9.15 with a standard deviation of 6.54. Performance on the phonetic reversal task resulted in a mean of 6.42 and a standard deviation of 5.68. In an effort to obtain a more representative assessment of general phonological awareness, the data for the two tasks were combined. The combined data for the group revealed a minimum score of 0 and a maximum score of 39 out of 40 possible. The group mean for this task was 15.66 with a standard deviation of 11.23. Considerable variability in performance among participants was noted on these tasks.

Morphological Awareness

Data from The Test of Morphological Structure (TMS) and the Comes From Task (CFT), were initially examined independently. The mean for the sample on the TMS was 18.28 with a standard deviation of 2.82. Errors for each type of derived form were as follows: orthographic only change 14.20%, phonological only change 25.30%, both orthographic and phonological change 34.57%, and neither orthographic nor phonological change 25.93%.

Performance on the CFT resulted in a mean of 19.06 and a standard deviation of 1.12. Errors for each type of derived form were as follows: orthographic only change 48.88%, phonemic only change 5.56%, both orthographic and phonological change 15.56%, and neither orthographic nor phonological change 30.00%.

Data for the two morphological awareness tasks were combined in an effort to better represent each participant's general morphological awareness. Participants demonstrated a minimum score of 21 and a maximum score of 40 out of 40 possible on this task. The group combined mean was 37.35 with a standard deviation of 3.22.

Correlations between Reading Comprehension and Reading Related Abilities

Examination of these descriptive statistics led to additional analysis regarding the relationships among variables. Pearson correlation coefficients were calculated to examine the relationships between reading comprehension and age in years, level of education, and occupational category. A positive correlation was found for level of education $r(94)= .31$, $p<.01$, indicating that participants with more education demonstrated higher reading comprehension scores. A negative correlation was found for age, $r(94)= -.26$, $p<.05$, indicating an inverse relationship between participant's age and reading comprehension score. The relationship between employment status and reading comprehension was not statistically significant, $r(94)= -.16$, $p>.05$.

Pearson correlation coefficients were calculated for the relationships between reading comprehension and reading vocabulary, decoding, phonological awareness, morphological awareness, and reading time (Table 2). Moderate positive correlations were found for vocabulary, $r(91)=.70$, $p<.01$, and morphological awareness, $r(94)=.53$, $p<.01$, indicating statistically significant relationships between both variables and reading comprehension. Slightly weaker, but statistically significant positive correlations were found for decoding, $r(94)=.41$, $p<.01$, and phonological awareness, $r(93)=.37$, $p<.01$, indicating statistically significant relationships between both variables and reading comprehension. Correlation coefficients are shown in Table 2. The relationship between

reading time and reading comprehension was not statistically significant, r(93)= -.16, p>.05. The variation in length of time spent reading was quite large although similar for both the narrative and expository passages. Reading time on the expository passage ranged from 27 to 171 seconds (*M*= 86.95 seconds, *SD*= 28.24) and the narrative passage reading time ranged from 32 to 170 seconds (*M*= 87.98 seconds, *SD*= 29.41).

Table 2

Relationship of Reading Comprehension and Reading Related Skills

Assessments	Pearson Correlation with Total Reading Comprehension Score
Word Identification	.39** (N=96)
Word Attack	.36** (N=96)
Decoding Total	.41** (N=96)
Reading Vocabulary	.70** (N=93)
Phoneme Switching	.37** (N=96)
Phonetic Reversal	.32** (N=95)
Phonological Awareness Total	.37** (N=95)
Test of Morphological Structure	.53** (N=96)
Comes From Task	.19 (N=96)
Morphological Awareness Total	.53** (N=96)
TotalReading Time	-.16 (N=95)

** p < .01

Physical Function and Activity Level

The mean score for the Composite Physical Function Scale was 22.29 (out of a possible 24) with a standard deviation of 3.14. This mean score for these participants demonstrated "intermediate functional ability" according to Rikli and Jones (1998). It should be noted that 55 of the 96 participants (58%) achieved the "advanced functional ability" rating by achieving a perfect score on this scale (24) and only 10 participants (11%) scored in the "low functional ability" range with a score of less than 18.

Pearson correlations were calculated to examine the relationship between reading comprehension and Composite Physical Function Scale (CPFS) scores. A statistically significant positive correlation was found between CPFS scores and reading comprehension, $r(93)= .22$, $p<.05$. The other measures of activity including current employment, $r(94)= .16$, $p>.05$, volunteering outside the home, $r(94)= .17$, $p>.05$, and volunteer hours per week, $r(86)= .15$, $p>.05$, did not demonstrate statistically significant correlations.

Awareness of Strategies for Improving Reading Comprehension

In order to determine the level of awareness that older adults have regarding strategies used to improve reading comprehension, two measures were used. First, reading strategy awareness was examined using the Reading Strategy Awareness Inventory (Miholic, 1994). The complete table of indicated strategies used and prioritized rankings can be found in Appendix I. Each of the strategies listed was reported to be used by at least some of the participants. Of those strategies marked by participants, 83.84% were strategies that were deemed to be "correct" by the original author and 16.16% of the strategies marked by these participants were those deemed to be "ambiguous."

Reading Fluency

The second measure of strategy awareness was a reading fluency measure including miscue analysis. Reading fluency was calculated in terms of the correct number of words read aloud per minute for the oral reading of the Rainbow Passage. The mean reading fluency for this sample was 170.40 words with a standard deviation of 21.98. Results of the miscue analysis indicated that the majority of miscues were substitutions and corrections at 34.05 and 33.03 percent respectively. Insertions accounted for 13.76 percent of the miscues, omissions accounted for 11.92 percent of the errors, and repetitions accounted for 7.33 percent of the miscues. It should be noted that 41.70 percent of participants had no miscues. A Pearson correlation coefficient was calculated for the relationship between reading fluency and reading comprehension. A statistically significant positive correlation was found between the two variables, $r(94)=.22$, $p<.01$.

Qualitative Outcomes

Participant responses to the two open-ended questions asked at the conclusion of the structured testing varied greatly in length and detail. Some of this variability in response may have been due at least in part to the length of the structured test protocol, as some participants were visibly fatigued by the end of the session.

An open-ended question was posed to participants, "When you had to answer the questions about what you read, how did you do it?" Several common themes were identified in participants' responses. The most commonly occurring response had to do with attending to and rehearsing specific facts or the perceived pertinent information. The second theme was a much more general notion of increasing attention or awareness. The participants' responses included such comments as "thought about it," "paid attention,"

"concentrated," "read carefully," and the most commonly occurring response in this category, "tried to remember." This result appears to be in conflict with the results of the Reading Strategy Awareness Inventory results described earlier. While participants were able to identify strategies that they used in given situations when presented to them, it appeared that it was much more difficult for these individuals to describe the strategies that they used in this specific situation.

Of the participants who described re-reading as a strategy, half indicated that they re-read the entire passage and half indicated that they selectively re-read portions of the passage. Predicting what the investigator might ask was another common strategy described by these participants. They described trying to "anticipate what you might ask" and trying to "pick out what might be a question." The final theme identified was reducing rate of reading. This strategy also was identified as being used frequently on the Reading Strategy Awareness Inventory results described earlier.

Frequency and Types of Reading Materials Used by Older Adults

The Author Recognition Test was scored by subtracting the proportion of "foil" errors from the proportion of correct responses. A group mean of .57 with a standard deviation of .24 was obtained. This result was similar to the mean of .52 (*SD* = .25) found in the original study by West, Stanovich, and Mitchell (1993). The mean number of foils marked per participant was 0.10 for this sample and 0.20 for the original study participants. Thirteen percent of participants in the original study marked foils compared to eight percent of the current sample.

Many participants verbalized difficulty with differentiating between "on a regular basis" and "often" on the Reading Habits Survey. For the purpose of discussion, the

43

responses "on a regular basis" and "often" have been combined. Because some participants appeared to make a distinction between the two, all results are reported in Table 3. Results of the survey indicated that 43.80% of these participants read for business "on a regular basis" or "often" and almost twice that number, 83.30%, reported that they read for pleasure "on a regular basis" or "often." Nearly all (95.80%) of the participants in this study indicated that they read the newspaper "on a regular basis" or "often." Three-quarters (76%) indicated that they used electronic mail and 50% indicated that they used the Internet "on a regular basis" or "often." Additional data regarding other indicators of reading behavior are provided in Table 4.

Table 3

Type of Reading Activity

| | Percent Responding | | | | | |
	Never	Hardly Ever	Once in a while	On a regular basis	Often	Missing
How often do you read for business?	12.50	9.40	34.40	31.30	12.50	0
How often do you read for pleasure?	2.10	2.10	12.50	19.80	63.50	0
How often do you read for children?	24.00	32.30	26.00	7.30	9.40	0
How often do you read electronic mail?	15.60	3.10	4.20	25.00	51.00	1.00
How often do you read the Internet?	17.70	12.50	18.80	21.90	28.10	1.00
How often do you read newspapers?	0.00	0.00	2.10	20.80	75.00	2.10

The majority of participants in this study indicated that their reading habits had changed over time. Of the 64.60% who indicated their habits had changed, 28.10% indicated that they read more, 7.30% indicated that they read less, and 26.00% reported a change in the type of material they read. There were 4.20% of responses that could not be classified into one of these categories. Data were collected for three questions related to the frequency of buying or borrowing books. Results indicated that only six percent of participants reported that they "never" borrow books, and no participants indicated that they "never" visit bookstores or purchase books. Other indicators of reading habits (e.g., belonging to a book club) were assessed using a yes/no response (see Table 4).

Table 4

Indicators of Reading Habits (N=96)

	Percent		
	"Yes"	"No"	Missing
Do you own or regularly use a reading light?	55.20	44.80	0
Do you own or regularly use bookmarks?	92.70	7.30	0
Do you own or regularly use a magnifying glass?	45.80	54.20	0
Do you belong to a book club?	17.70	81.30	1
Do you own a frequent reader card?	17.70	80.20	2.10
Do you own a library card?	77.10	20.80	2.10
Do you have a magazine subscription?	95.80	4.20	0

In addition to the total score for reading habits, the types of reading materials on the Reading Habits Survey were divided into two general categories, high information content and low information content, using the same general guidelines as noted by the original authors. While some specific items within each category were felt by the investigator, to have more or less content than others, related items were kept together within the information content categories (see Table 5).

Table 5

Reading Materials and Habits (N=96)

	Maximum Possible	Range	Mean	SD
High Information Content Materials				
How often do you read books?	28	2 - 23	14.06	4.26
How often do you read electronic resources?	12	0 - 12	6.27	3.22
How often do you read forms?	32	2 - 31	17.11	5.45
How often do you read periodicals?	24	4 - 21	12.60	3.30
How often do you read pamphlets?	8	1 - 8	4.32	1.84
Total for high information content	104	16 – 79	54.38	11.06
Low Information Content Materials				
How often do you read correspondence?	28	6 - 24	15.41	4.00
How often do you read labels?	28	7 - 28	18.38	4.42
How often do you read recreational materials?	8	0 - 8	2.49	1.79
How often do you read reference materials?	32	6 - 30	17.70	4.99

Table 5 (continued)

	Maximum Possible	Range	Mean	SD
Total for low information content	96	27 - 76	53.97	10.91
Composite Reading Habits				
Total Reading Habits (High and Low Information Content)	200	47 - 151	108.34	19.95

Pearson correlations were calculated for the relationship between reading comprehension and either high or low information content (see Table 6). Statistically significant positive correlations were noted for total reading habits and low information content; however, the relationship between high information content material and reading comprehension was not statistically significant. Examination of the specific types of reading material demonstrated statistically significant positive correlations between reading comprehension and reading books, correspondence, electronic resources, and reference materials. There was a significant negative correlation between reading comprehension and reading pamphlets.

Table 6

Correlation of Reading Comprehension and Types of Reading Materials (N=96)

	Pearson Correlation with Total Reading Comprehension
High Information Content Materials	
How often do you read books?	.29 **
How often do you read electronic resources?	.22 *
How often do you read forms?	.09
How often do you read periodicals?	-.03
How often do you read pamphlets?	-.23 *
Total High Information Content	.17
Low Information Content Materials	
How often do you read correspondence	.24
How often do you read labels	.07
How often do you read recreational materials	.11
How often do you read reference materials	.26 **
Total Low Information Content	.25*
Total Reading Habits	.23*

* $p < .05$
** $p < .01$

Qualitative Outcomes

When asked to describe what they read, participant responses could be categorized into six general categories. The most commonly occurring response was news related material such as newspapers, news magazines, and other current event publications. While the majority of participants (95.80%) indicated that they read the newspaper often or on a regular basis on the Reading Habits Survey, it was interesting to note that only about 50% of the participants reported reading the daily newspaper in the qualitative interview. It was felt that these participants may not have perceived newspaper reading as noteworthy but rather considered it to be a routine activity. Reading of religious material, including the Bible and other spiritual and inspirational material, was the second most commonly occurring theme. Many participants commented that they had become more interested in reading religious material as they aged. Other common themes that emerged from the data included reading related to particular hobbies or travel, history or historical novels, biographies, and mysteries. The relatively high occurrence of reported reading about hobbies and travel would be expected given the percentage of participants who were retired as well as the high physical function of the group. The investigator identified the reading of health and wellness information as a theme subjectively, but when the data were analyzed, only a small number of participants actually described this type of reading materials. One explanation for this inconsistency was that the participants who reported reading this type of material tended to describe it at length and with some conviction. The participants in this study were generally in good physical condition and active, which likely may have influenced their selection of reading materials.

Reading Attitude

A score of 45 on the Reading Attitude Scale would indicate a neutral attitude, with higher scores indicating a more positive reading attitude. The range of possible scores for the modified version used in this study was 15 to 75. The range of scores for these participants was 41-75 ($M = 67.16$, $SD = 7.19$). Only two participants in this group demonstrated a reading attitude score which fell below the "neutral" level. This finding indicated a generally positive attitude toward reading within this sample which was expected in a group of participants who volunteered for a study about reading.

CHAPTER V

DISCUSSION

Summary

The purpose of this study was to examine the types of materials and strategies that

older adults use for reading. The questions addressed in this study included: what are the

reading and reading related abilities of older adults?; what is the level of awareness that

older adults have regarding strategies used to improve reading comprehension?; and what

types of materials and with what frequency do older adults read?

Data for this study were analyzed from 96 community dwelling adults between

the ages of 65 and 79 years. The Word Identification and Word Attack subtests of the

Woodcock Reading Mastery Test (Woodcock, 1998) were used as a measure of decoding

ability. The vocabulary subtest of the Nelson-Denny Reading Test (Brown et al., 1993)

was used as a measure of reading vocabulary. In addition, several nonstandardized tasks

were included to examine reading comprehension, phonological awareness, and

morphological awareness. Four survey instruments also were used to assess awareness of

reading strategies, print exposure, reading habits, and attitudes about reading.

Reading and Reading Related Abilities of Older Adults

Participants in this study demonstrated reading comprehension and reading

related skills which were generally above average. This finding did not come as a

surprise because the group was highly educated as a whole. Reading comprehension has

been shown to be positively correlated with level of education and negatively correlated

with age (Glosser & Deser, 1992; Kemper et al., 1989; Norman et al., 1992; Zabrucky &

Moore, 1994) and the current results supported these relationships. Participants in this

51

study tended to be more highly educated than the general population in Kansas (U. S. Census Bureau, 2002). For these reasons, it is likely that volunteer bias has influenced the results in that participants were predominantly individuals who enjoy reading and are successful readers.

Reading Comprehension

The QRI-3 did not provide normative data for this age group; however, the increased comprehension performance on the expository passage as compared to the narrative passage in this sample was similar to the difference between responses to the two types of text in the school-aged sample described in the QRI-3. Leslie and Caldwell (1995) found no significant difference in comprehension between the two types of text. They did, however, find that sixth grade readers were able to retell more of the narrative passage, but demonstrated greater prior knowledge of the expository text. Prior knowledge also may have contributed to the greater difference between expository passage and narrative passage comprehension in this sample. These results also supported the findings of Harris, Rogers, and Qualls (1998) and Zelinski and Gilewski (1988) who found that performance on reading comprehension tasks related to expository text was superior to performance on comprehension tasks related to narrative text in older adults. One possible explanation for this was that expository texts, such as newspapers, were more frequently encountered by older adults.

The ability to generalize these results was limited in that only one passage of each type was read by these participants. The specific reading passages selected for this study also may have influenced the results. There is variability in the way that researchers define narrative and expository text. It has been shown that narrative texts which include

the major story grammar components (e.g., setting, initiating event, attempt, and consequence) produce increased recall by both children and adults (Brennan, Bridge, & Winograd, 1986; Graesser, Hauft-Smith, Cohen, & Pyles, 1980). The passages chosen from the QRI-3 were categorized as expository and narrative texts by Leslie and Caldwell; however, the narrative passage selected (Andrew Carnegie) did not include all of the major story grammar components.

Decoding

Participants in this study demonstrated strong decoding and vocabulary skills compared to normative samples on the standardized measures. Scores for this sample on both the Word Identification and Word Attack subtests of the Woodcock Reading Mastery Tests-Revised (Woodcock, 1998) fell within the first standard deviation above the mean for this instrument. Likewise, scores on the Vocabulary subtest of the Nelson-Denny Reading Test (Brown et al., 1993) fell above the first standard deviation of the mean for this instrument. These results are again likely a reflection of the high level of education within this sample.

Phonological and Morphological Awareness

The relationship between reading and phonological awareness has been described in children and in younger adults (Greenberg et al., 1997; Pratt & Brady, 1988) but has not been described well in older adults. Adults in this sample performed similarly to the young adult college students between the ages of 20 to 24 years described by Moran and Fitch (2001) in the pattern of performance on the phonological awareness tasks. It was noted, however, that the older adults in this sample demonstrated a greater difference in performance between the two tasks. Phonetic reversal scores were noted to be lower than

phoneme switching in both age groups but a larger difference between the two scores was noted in the older adults in the current sample. The college-aged participants were asked to write their responses to these tasks in a group setting. The participants in this study were asked to give their responses verbally. Being able to see their responses in written form may have provided the younger participants with an opportunity to modify their responses. The time allowed for responding for the two tasks was not equivalent (more time was allowed for the phoneme switching task) and that may have influenced the difference in performance on the two tasks for the older adults.

Much less variability in performance within the group was noted on the morphological awareness tasks. While the group mean for this skill indicated strong performance, the pattern of errors was interesting. On the Test of Morphologic Structure (Carlisle, 2000), the most frequently occurring (34.57%) error type was the both orthographic and phonological change condition. The most frequently occurring error type on the Comes From Task (Katz, 2004) occurred on items with orthographic only changes. According to Katz, the "both change" situation was the most difficult for children. The findings from this study may have been influenced by the limited number of target stimuli in each derived form category. For example, one of the five words on the CFT accounted for over half (54.55%) of the errors in the orthographic only change condition (fortunate/fortune). In limiting the number of items on these tasks, the validity of the findings also was limited. A different subset of words selected for inclusion in the task may have produced different findings.

Awareness of Strategies for Improving Reading Comprehension

In general, the adults in this study identified strategies which would be considered to be appropriate for improving reading comprehension (Miholic, 1994). Participants in this study appeared to be aware of the strategies they used to improve reading comprehension even though they may not have been aware of which strategies were most effective. The results of the Reading Strategy Awareness Inventory indicated the use of several strategies related to re-reading and relation of reading material to prior knowledge. The greatest number of responses indicated that reading an entire passage over again was a strategy to clarify specific or supporting ideas. This finding was in agreement with earlier studies (e.g., Zabrucky & Moore, 1994) which indicated that older adults tended to re-read an entire passage rather than selectively re-reading portions of the text. Reading time, which could indicate re-reading, was not correlated with reading comprehension in the current study.

Reading Fluency

The other measure used to examine reading strategies was a miscue analysis. Participants in this study demonstrated a mean oral reading fluency rate of 170.40 words per minute with a standard deviation of 21.98. Considerable variability was noted in fluency within the group with number of correct words per minute ranging from 105.63 to 218.78. The two most frequently occurring types of miscues were substitutions at 34.05% and corrections at 33.03%. The high percentage of corrections would suggest that the older adults in this study were aware of errors they made in oral reading. The substitution miscues appeared to be largely anticipatory in nature, consisting of tense changes or whole word substitutions when the reader mistakenly anticipated a different

ending to the sentence. These findings would suggest that adults in this study were aware of errors made during oral reading and made efforts to correct them. While miscue analysis (Nelson, 1994) has been used in the assessment of children's oral reading abilities, no data are available for adults. This suggests an area for future research.

Frequency and Types of Reading Materials Used by Older Adults

Many studies have reported that the newspaper is the most common genre of reading material for older adults (Guthrie & Seifert, 1983; Kirsch & Guthrie, 1978; Robinson, 1980; Sharon, 1973; Smith, 1996). Findings from this study strongly supported that finding. This may be an additional explanation for the finding that participants in this study demonstrated greater comprehension of the expository reading passage. Because the newspaper is generally written in expository style, older adults would have more frequent practice with this type of text.

Previous studies have not examined reading of electronic media. It had been shown previously that administration of reading material by computer screen had a positive effect on reading comprehension and recall in both young and old participants (Moore & Zabrucky, 1995; Zabrucky & Moore, 1994). In the current study, half of the participants indicated that they used the Internet to read information "often" or "on a regular basis." This finding would suggest that perhaps older adults have found that they are better able to comprehend material read on-line, or it may be that, like younger adults, they have discovered that they can locate information quickly and efficiently using the Internet. Clinicians treating older adults will need to consider the frequency of Internet usage for information and communication when designing individual treatment plans.

The current results indicated that the total amount of material participants read was positively correlated with reading comprehension; however, the reading of high information content materials or low information content materials did not demonstrate an obvious pattern. These results may have been due at least in part to the differences in the content of materials within the given categories. It also was likely that simply an increase in reading, regardless of the material selected, was the determining factor in the participants' overall reading comprehension skill.

Strengths of the Current Study

This study included a large sample of healthy older adults. Previous studies have examined various facets of reading comprehension and reading related skills in older adults but few if any to date have considered a group of participants as large as the current sample. Likewise, most of the previous research has provided information related to specific reading or related skills, but few if any have examined the wide range of skills included in this study. Data obtained in this study, in addition to information regarding reading comprehension, included assessments of decoding skills, reading vocabulary, phonological awareness, morphological awareness, reading fluency, reading strategies, exposure to print, reading attitude, and reading habits.

The homogenous nature of the educational background in this group of participants may actually be considered as a strength of this project. If the older population has become better educated in recent years, as shown in the census data, then clinicians must be prepared to serve this more highly educated group. The homogenous nature of the participant group provided support that the current findings were valid.

Limitations of the Study

Limitations of this study included lack of ethnic diversity in the sample, lack of diversity in educational levels, and a disproportionately large number of female participants. The investigator attempted to recruit participants through the local newspaper as well as through community organizations which serve primarily underserved populations. The director of one community facility told the investigator that while the facility would support this research, it was highly unlikely that many of their clients would volunteer because she did not feel that reading would be a topic of interest to them. In the process of recruiting participants, the investigator encountered a number of potential participants who refused to participate and indicated they felt they were not "good readers."

Clinical and Educational Applications

This research was precipitated by the primary investigator's experience in working with adults with a variety of neurologic impairments and the difficulties encountered in trying to select appropriate materials and strategies for treatment of reading disorders. While the participants in this study were more highly educated than the general population in Kansas and free of neurologic deficits, the results warrant careful consideration by clinicians as they encounter older adults as clients. This study highlights the need for clinicians to consider the level and genre of reading material provided to their clients. It also may be important to consider the mode of presentation of reading materials, as more than half of the participants in this study reported using the computer to access printed materials.

The investigator's original hypothesis about comprehension of text genre was based on the premise that the predictable sequence or story grammar of the narrative text would result in increased reading comprehension. In addition, clinical experience led the investigator to believe that older adults with language deficits performed better on narrative text. Results of this study indicate that when matched for length and reading level, the expository text elicited better performance in this limited sample of reading material.

Materials commonly used in rehabilitation settings include reading passages of increasing lengths and subjective level of difficulty; however, the text genre and readability level are rarely if ever specified. Clinicians should be encouraged to evaluate the reading materials they use in treatment based on a number of parameters including, but not limited to, length. The current results indicated a significant difference in participants' performance related to question type (i.e., implicit vs. explicit) suggesting that clinicians should consider the impact of question type when assessing reading comprehension.

The results of this study highlighted the need for clinicians to consider incorporating training of specific strategies, e.g., selective re-reading, in their treatment of reading disorders in older adults. In the current study, participants demonstrated use of reading comprehension strategies; however, the strategies identified were not necessarily effective. It remains every clinician's responsibility to train strategies which are both efficient and efficacious.

Research Needs

The participants in this study were relatively homogenous in terms of ethnicity and educational level making generalization difficult. This was a common theme in previous research involving adult readers as well. It is difficult to recruit adults for reading research if they do not value reading. While recruiting participants from residential facilities might achieve a wider range of ethnic diversity, it also would likely increase the risk of confounding medical issues which could obscure the results. It would be of value to compare the current results with a sample of greater ethnic and educational diversity.

Further research including adults both older and younger than participants in this study would be necessary to further evaluate the role of phonological awareness and morphological awareness skills in reading comprehension in adults. The areas of phonological and morphological awareness should be studied in smaller cohort groups in an effort to verify the stability of these reading related skills across the age span from college students in their 20s to older adults between the ages of 65 and 79. Further research including adults with more diverse educational background and reading level also would be warranted in light of the finding that there was such variability in performance on the two phonological awareness tasks and the two morphological awareness tasks in the current sample of readers who were good readers.

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APPENDIXES

APPENDIX A

Informed Consent

PURPOSE: You are invited to participate in a study of reading and reading related skills. We hope to learn what types of materials and with what frequency older adults read, as well as what level of awareness typical adults have regarding strategies used to improve reading comprehension.

PARTICIPANT SELECTION: You were selected as a possible participant in this study because you are an older adult living in the community.

EXPLANATION OF PROCEDURES: If you decide to participate, you will be asked to take a survey about your health, and pass a hearing and vision screening. If you pass the screening, you will complete a protocol of tasks including: reading comprehension for both narrative and expository texts, oral reading, awareness of sounds and symbols, awareness of word meanings, and general language ability. You also will be asked to complete a survey related to your awareness of various strategies you might use to improve your reading comprehension. Additionally, information regarding your reading habits and history will be obtained using a variety of survey instruments.

DISCOMFORT/RISKS: There are no known risks or discomforts associated with this study.

BENEFITS: The results should provide useful information to guide Speech Language Pathologists toward developing and selecting more functional materials/goals for older adults in regard to reading.

CONFIDENTIALITY: Any information obtained in this study in which you can be identified will remain confidential and will be disclosed only with your permission.

COMPENSATION OR TREATMENT: Wichita State University does not provide medical treatment or other forms of reimbursement to persons injured as a result of or in connection with participation in research activities conducted by Wichita State University or its faculty, staff, or students. If you believe that you have been injured as a result of participating in the research covered by this consent form, you can contact the Office of Research Administration, Wichita State University, Wichita, KS 67260-0007, telephone (316) 978-3285.

REFUSAL/WITHDRAWAL: Participation in this study is entirely voluntary. Your decision whether or not to participate will <u>not</u> affect your future relations with Wichita State University. If you agree to participate in this study, you are free to withdraw from the study at any time without penalty.

CONTACT: If you have any questions about this research, you can contact Jill Champley at 978-6646 or Julie Scherz at 978-5344. If you have questions pertaining to your rights as a research subject, or about research-related injury, you can contact the Office of Research Administration at Wichita State University, Wichita, KS 67260-0007, telephone (316) 978-3285.

You are under no obligation to participate in this study. Your signature indicates that you have read the information provided above and have voluntarily decided to participate.

You will be given a copy of this consent form to keep.

_____
Signature of Subject   Date

_____
Witness Signature   Date

Phoneme Switching

You are going to hear a series of two word phrases. However, in each phrase, the first sound of the first word and the first sound of the second word have been transposed. Listen as the phrase with the transposed sounds is produced; then say what you think the real phrase is. For example, if the speaker said *dit sown*, you would say *sit down*. Remember, listen to the sounds. Do not concern yourself with the letters or spelling. Consonant clusters are treated as a single sound so *near clight* would be *clear night*. You will hear each pair of words only once, so listen carefully.

1.	had bear	(bad hair)
2.	dasta pish	(pasta dish)
3.	carine mernal	(marine colonel)
4.	bity sus	(city bus)
5.	dever clevil	(clever devil)
6.	mean kwuther	(nanny goat)
8.	boft sed	(soft bed)
9.	ben tucks	(ten bucks)
10.	bother mear	(mother bear)
11.	cocal vord	(vocal cord)
12.	wowly lerm	(lowly worm)
13.	toe shunes	(show tunes)
14.	saf hister	(half sister)
15.	jude croke	(crude joke)
16.	dreet sweam	(sweet dream)
17.	bug toat	(tug boat)
18.	racid pliver	(placid river)
19.	wable tine	(table wine)
20.	falad sork	(salad fork)

Source: (Moran & Fitch, 2001)

Phonetic Reversal

You will hear several words. Each word is phonetically reversible; that is, sequencing the sounds from last to first creates another word. For example, *stop* backwards is *pots*. Remember to think about the sounds and not the spelling, so *knife* backwards is *fine*. Listen to each word, then say the new word it makes backward. You will hear each word only once, so listen carefully.

1.   sick   (kiss)
2.   fix   (skiff)
3.   enough   (funny)
4.   foe   (oaf)
5.   rope   (pour)
6.   nuts   (stun)
7.   isle   (lie)
8.   ice   (sigh)
9.   cool   (Luke)
10. lewd   (duel)
11. scott   (talks, tox)
12. scope   (pokes)
13. light   (tile)
14. Knicks   (skin)
15. kneel   (lean)
16. peace   (seep)
17. gave   (vague)
18. might   (time)
19. knack   (can)
20. nose   (zone)

Source: (Moran & Fitch, 2001)

Test of Morphological Structure

INSTRUCTIONS: You will hear a word followed by an incomplete sentence. Fill in the blank in the sentence using a form of the word. (START CD)

Practice items:
a. Farm. My uncle is a _____(farmer)
b. Help. My sister is always _____(helpful)

1. Warm. He chose the jacket for its _____(warmth)
2. Teach. He was a very good _____(teacher)
3. Permit. Father refused to give _____(permission)
4. Express. "OK" is a common _____(expression)
5. Protect. She wore glasses for _____(protection)
6. Endure. The activity required great _____(endurance)
7. Expand. The company planned an _____(expansion)
8. Revise. This paper is his second _____(revision)
9. Reason. Her argument was quite _____(reasonable)
10. Major. He won the vote by a _____(majority)
11. Deep. The lake was well know for its _____(depth)
12. Equal. Boys and girls are treated with _____(equality)
13. Long. They measured the ladder's _____(length)
14. Adventure. The trip sounded _____(adventurous)
15. Absorb. She chose the sponge for its _____(absorption)
16. Vary. The weather has been somewhat _____(variable)
17. Human. The kind man was known for his _____(humanity)
18. Wash. Put the laundry in the _____(washer)
19. Assist. The teacher will give you _____(assistance)
20. Glory. The view from the hill top was _____(glorious)

Source: (Carlisle, 2000)

Comes From Task (CFT)

Directions: *You are going to see pairs of words. Your job is to decide whether the first word in the pair "comes from" the second word in the pair. If you think that the first word comes from the second word, you will circle yes. If you think that the first word does NOT come from the second word you will circle no.*

Think about the words "teacher" and "teach." It makes sense to say that teacher comes from teach because the two words are related in meaning. So you should circle the Y for "yes." Now think about the words "single" and "sing". It does not make sense to say that single comes from sing because the two words are not related in meaning even though they are similar in spelling. So you should circle the N for "no" for this item. Try the next two.

[After the participant has responded to the practice items] *Do you have any questions? Try to respond to the words as quickly and as accurately as you can.*

Practice Items
A. teacher   teach   Y N
B. single   sing   Y N
C. booklet   book   Y N
D. belly   bell   Y N

Test Items
1. personal   person   Y N   18. reliable   rely   Y N
2. mention   men   Y N   19. mission   miss   Y N
3. flight   fly   Y N   20. election   elect   Y N
4. dollar   doll   Y N
5. depth   deep   Y N
6. imaginary   imagine   Y N
7. global   globe   Y N
8. shoulder   should   Y N
9. tension   tense   Y N
10. reality   real   Y N
11. dinner   dine   Y N
12. summary   sum   Y N
13. tiny   tin   Y N
14. sentence   sent   Y N
15. fortunate   fortune   Y N
16. decision   decide   Y N
17. ability   able   Y N

Source: (Katz, 2004)

Reading Strategy Awareness Inventory

There are many ways to cope when you run into difficulties in your reading. Under each question here, mark all the strategies you feel you use. If you mark more than one, please try to prioritize them (1 strategy you use most, 2 ,3) but you do not need to mark every line.

1. What do you do if you encounter a word and you don't know what it means?
   a. use the words around it to figure it out
   b. use an outside source, such as a dictionary or expert
   c. temporarily ignore it and wait for clarification
   d. sound it out

2. What do you do if you don't know what an entire sentence means?
   a. Read it again
   b. Sound out all the difficult words
   c. Think about the other sentences in the paragraph
   d. Disregard it completely

3. What do you do to remember important information you've read?
   a. Skip the parts you don't understand
   b. Ask yourself about the important ideas
   c. Realize you need to remember one point rather than another
   d. Relate it to something you already know

4. Before you start to read important material, what kind of plans do you make to help you read better?
   a. No specific plan is needed, just start reading
   b. Think about what you know about the subject
   c. Think about why you are reading
   d. Think about whether you will have enough time to finish reading

5. Why would you go back and read an entire passage over again?
   a. You didn't understand it
   b. To clarify a specific or supporting idea
   c. It seemed important to remember
   d. Because I realized I wasn't paying attention

6. Knowing that you don't understand a particular sentence while reading involves understanding that
    a. The reader may not have developed adequate links or associations for new words or concepts introduced in the sentence
    b. The writer may not have conveyed the ideas clearly
    c. Two sentences may purposely contradict each other
    d. Finding meaning for the sentence needlessly slows down the reader

7. As you read different types of materials, which of these do you do?
    a. Adjust your pace depending on the difficulty of the material
    b. Generally, read at a constant steady pace
    c. Skip the parts you do not understand
    d. Continually make predictions about what you are reading

8. While you read, which of these are important?
    a. Know when you know and when you don't know key ideas
    b. Know what it is that you know in relation to what is being read
    c. Know that confusing texts is common and usually can be ignored
    d. Know that different strategies can be used to aid understanding

9. When you come across a part of the text that is confusing, what do you do?
    a. Keep reading until the text is clarified
    b. Read ahead and then look back and see if the text is still unclear
    c. Skip those sections completely; they are usually not important
    d. Check to see if ideas expressed are consistent with one another

10. Which sentences are most important in the chapter?
    a. Almost all of the sentences are important; otherwise they wouldn't be there
    b. The sentences that contain the important details or facts
    c. The sentences that are directly related to the main idea
    d. The ones that contain the most details

Souce: (Miholic, 1994)

APPENDIX G

Author Recognition Questionnaire

Below you will see a list of 25 names. Some of the people in the list are popular writers (of books, magazine articles, and/or popular newspaper columns) and some are not. Please read the names and put a check mark next to the names of those individuals who you know to be writers. Do not guess but check only those who you know to be writers.

Source: (West et al., 1993)

_____	Mitch Albom	_____	Diane Paul
_____	Dan Brown	_____	Richard Peach
_____	Robert Burkard	_____	J D Robb
_____	Clive Cussler	_____	Sidney Sheldon
_____	Ian Fleming	_____	Nicholas Sparks
_____	Craig Formby	_____	Danielle Steele
_____	Elizabeth George	_____	Kathleen Whitmire
_____	Brian Goldstein	_____	Bob Woodward
_____	John Grisham		
_____	Thomas Hixon		
_____	Alan Kamhi		
_____	Dean Koontz		
_____	Judith Krantz		
_____	Louis L'Amour		
_____	Robert Ludlum		
_____	Pam Mason		
_____	James Michener		

APPENDIX H

Reading Attitude Scale

Reading is for learning but not for enjoyment.
 a. strongly agree
 b. agree
 c. undecided
 d. disagree
 e. strongly disagree

Money spent on books is well spent.
 a. strongly agree
 b. agree
 c. undecided
 d. disagree
 e. strongly disagree

There is nothing to be gained from reading books.
 a. strongly agree
 b. agree
 c. undecided
 d. disagree
 e. strongly disagree

Books are a bore.
 a. strongly agree
 b. agree
 c. undecided
 d. disagree
 e. strongly disagree

Reading keeps my interest.
 a. strongly agree
 b. agree
 c. undecided
 d. disagree
 e. strongly disagree

Books aren't usually good enough to finish.
 a. strongly agree
 b. agree
 c. undecided
 d. disagree
 e. strongly disagree

Reading is rewarding to me.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

Reading becomes boring after about an hour.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

Most books are too long and dull.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

There are many books which I hope to read.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

Books should not be read except for information.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

Reading is something I can do without.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

A certain amount of time should be set aside for reading.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

Books make good presents.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

Reading is dull.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

Source: (Estes, 1971)

Reading Strategy Awareness Inventory Responses

Question	Strategy	N	Rate 1	Rate 2	Rate 3	Rate 4
1) What do you do if you encounter a word and you don't know what it means?	+Use and outside source, such as a dictionary	85	37	32	14	2
	+Use the words around it to figure it out	68	50	17	1	0
	+Temporarily ignore it and wait for clarification	28	6	11	7	4
	Sound it out	23	4	10	5	4
2) What do you do if you don't know what an entire sentence means?	+Read it again	88	76	10	2	0
	+Think about the other sentences in the paragraph	80	20	59	1	0
	Sound out all the difficult words	16	0	4	12	0
	Disregard it completely	8	0	1	1	6
3) What do you do to remember important information you've read?	+Relate it to something you already know	77	45	26	6	0
	+Ask yourself about the important ideas	61	34	19	8	0
	+Realize you need to remember one point rather than another	44	16	19	9	0
	Skip the parts you don't understand	8	1	1	1	5
4) Before you start to read important material, what kinds of plans do you make to help you read better?	+Think about why you are reading	57	27	27	2	1
	+Think about what you know about the subject	47	24	19	4	0

APPENDIX I (continued)						
	No specific plan is needed, just start reading	46	40	2	4	0
	Think about whether you will have enough time to finish reading	14	4	6	2	2
5) Why would you go back and read an entire passage over again?	To clarify a specific or supporting idea it	65	36	22	7	0
	+Because I realized I wasn't paying attention	58	18	16	11	13
	+It seemed important to remember	56	12	28	14	2
	+You didn't understand	55	31	14	10	0
6) Knowing that you don't understand a particular sentence while reading involves understanding that	+The writer may not have conveyed the ideas clearly	63	42	21	0	0
	+The reader may not have developed adequate links or associations	59	39	17	3	0
	Finding meaning for the sentence needlessly slows down the reader	19	10	4	2	3
	+Two sentences may purposely contradict each other	17	2	7	7	1
7) As you read different types of materials, which of these do you do?	+Adjust pace depending on the difficulty of the material	86	80	6	0	0
	Generally, read at a constant steady pace	34	14	18	2	0
	Skip the parts you do not understand	13	3	6	2	2
	+Continually make predictions about what you are reading	10	1	4	5	0

APPENDIX I (continued)						
8) While you read, which of these are important to you?	+Know that different strategies can be used to aid understanding	66	31	19	16	0
	+Know what it is that you know in relation to what is being read	64	31	28	5	0
	+Knowing when you know and when you don't know key ideas	55	33	16	5	1
	Know that confusing text is common and usually can be ignored	5	1	1	1	2
9) When you come across a part of the text that is confusing, what do you do?	+Read ahead and then look back and see if the text is still unclear	71	40	28	3	0
	+Keep reading until the text is clarified	70	42	26	2	0
	+Check to see if ideas expressed are consistent with one another	34	11	10	13	0
	Skip those sections completely	5	1	1	0	3
10) Which sentences are most important in the chapter?	+The sentences that are directly related to the main idea	70	45	24	1	0
	+The sentences that contain the important details or facts	67	36	30	1	0
	Almost all of the sentences are important	28	15	3	7	3
	The ones that contain the most details	12	0	1	10	1

(+ Strategies identified as "correct" responses)

Source: (Miholic, 1994)