

Formatting the Document:

- margins 1 inch on all sides
- entire document double spaced and in 12 point font (Times Roman)
- indent first line of every paragraph (except abstract)
- use a single space after :
 - commas, colons and semicolons
 - periods in a references
 - initials in a name
- use two spaces after punctuation marks at the end of a sentence

- Running head: abbreviated title; max of 50 characters written at top left of page followed by the page number at top right of page

Title Page contains four elements:

1. Title - typed in upper and lowercase letters, centered between left and right margins and positioned in upper half of the page
2. Authors – centered below title
3. Affiliation - centered below authors
4. The term “Running head:” appears before the Running head on the title page only

Title:

- summarizes the main idea of the paper
- should include the IV, DV, and the relationship between them

The Effect of Aging on Memory
Stacey Bryant and Steven Harvey
Camosun College

Abstract:

- brief, comprehensive summary of the paper
- allows readers to survey the contents of the paper quickly
- word limit is set by individual journals and typically ranges from 150-250 words
- it is on its own page, as single paragraph (not indented) with 'Abstract' centered at the top
- should be concise and self contained
- report what is in the paper, do not evaluate it
- do not include information that is not in the paper

The Abstract should include the following:

- the hypothesis under investigation
- pertinent participant information
- experimental method used and participant information
- the findings as they relate to the hypothesis
- conclusions and/or implications of the findings

* **Hint:** as a guideline include at least one summary sentence from each section of the paper

Abstract

The present experiment investigated the performance of 64 older and younger participants on a direct (free recall) and indirect (word stem completion) test of memory. It was hypothesized that older participants would not perform as well as younger participants on the free recall task but would perform similarly to their younger counterparts on the stem completion task. The results supported the hypothesis; younger participants performed significantly better than older participants on the free recall task, whereas no significant difference was found between the two age groups on the stem completion task. These results are discussed in terms of their important for current theories of memory.

Introduction:

- used to introduce the problem under investigation and describe the research strategy
- it begins on a new page with the title of the paper centered at the top (not in bold)

The Introduction should include the following:

- explore importance of the problem
- review relevant literature
- a brief discussion of how the research was conducted
- a description of the variables
- the hypothesis under investigation
- the rationale for the hypothesis (theory)

Note: do not discuss the results you obtained in the introduction

Hints on writing the paper:

- use first person active voice when referring to the actions of the author (experimenter)
- use past tense to describe variables manipulated and methods used
- use present tense for conclusions drawn

In Text Citation Examples:

Multiple authors: cite → the surnames and year. Separate multiple citations with a semicolon (for more details see below: Citations in Text)

Personal communication is cited in the text only, not in the reference list; provide the initials, last name and exact date. →

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The Effect of Aging on Memory

A common complaint among elderly adults is that they do not remember as well as they did when they were younger. This complaint has led to a great deal of research investigating age-related differences in memory performance. Many of these studies have compared young and elderly adults on direct and indirect tests of memory. The findings of such studies typically demonstrate that older adults perform at a comparable level to their younger counterparts on indirect tests but perform at a lower level than younger participants on direct tests (eg., Gordon & Clark, 1974; Maylor, 1990; Rabinowitz & Ackerman, 1982).

Most studies investigating memory in the elderly have used tests that assess episodic memory abilities. Episodic memory is memory for personally experienced events as they occur in a particular temporal/spatial context (Tulving, 1985). Examples of episodic memory tests include direct tests such as recognition and recall. These tests require a subject to consciously recollect a previous episode. Studies that have investigated episodic memory abilities in older adults have typically demonstrated that these individuals do not perform as well as their younger counterparts (Gordon & Clark, 1974; Rabinowitz & Ackerman, 1982). For example, it has been consistently found that older participants perform at a lower level than younger participants on test involving the free recall of information; older adults demonstrate impaired performance in free recall for words and prose (Gordon & Clark, 1974), as well as cue recall for paired associates (A. B. Robinback, personal communication, December 3, 2000)

For works with **no author**, cite the first few words of the title followed by the year; for web page and article titles use quotations and for book and periodical titles use italics. →

For citing a **secondary source**, provide the authors of the original work followed by “as cited” and a citation for the secondary source. Only the secondary source will appear in the reference list. →

Citations in Text:

- when there is **one or two authors**, cite the surname(s) and date every time the reference occurs
- when there are **three to five authors**, for the first occurrence cite the surnames and year; in subsequent citations, include the surname of the first author followed by ‘et al.’ and the year
- for all occurrences of works with **six or more authors**, cite the first author’s surname and date followed by “et al.”

Note: when using the term ‘and,’ use ‘and’ outside parentheses, and use ‘&’ within parentheses.

The impaired performance of older adults on direct tests of memory has not only been observed in the laboratory, but is also prevalent in situations representing real life experiences (Morrell, Park, & Poon, 1989; “Understanding aging and memory,” 1999). For example, older individuals demonstrate difficulty in recalling information on medicine labels (Morrell, et al., 1989) and in written passages (Ruber, 2002), as well as remembering activities they have performed (Kausler & Lichty as cited in Ying, 2001). Moreover, Maylor (1990; 1991) demonstrated that older adults are also impaired in their ability to recognize and name faces and tunes. Maylor (1990) also found younger adults performed better on a memory task involving object location than did older adults.

In contrast to direct test performance, however, older adults have been found to perform similarly to younger adults on indirect tests of memory. Indirect tests of memory are those that do not require the conscious recollection of a previous episode, but are indeed affected by those previous experiences. An example of an indirect is word stem completion, where the participant is provided with an incomplete word (e.g., mo---) and is asked to report the first word that comes to mind to complete the stem.

An example of an experiment comparing the performance of younger and older participants on an indirect test was conducted by Light and Singh (1987). These researchers found that on average older adults scored comparable to younger adults on tasks involving word stem completion and masked word identification. Moreover, Light and Albertson (1989)

Quotes: should be used sparingly. It is best to summarize the ideas of the researcher in your own words and then cite the source

A short quotation (**less than 40 words**) should be enclosed with double quotation marks and should be incorporated into the text. The source of the quotation; author, year, and page number should be cited.

A quotation of **40 or more words** should be written in a separate new paragraph. Do not use quotation marks. The entire quotation (all lines of the quotations) should be indented ½ inch. Following the final punctuation, the source of the quotation; author, year, and page number should be cited in parentheses.

* **Hint:** Try to end your introduction with a statement of your prediction(s) and an explanation as to why you might make this prediction

Method:

- describes in detail how the study was conducted
- allows the reader to evaluate the procedures and replicate if desired
- typically divided into labeled subsections

1) Participants:

- include a description of the selection and assignment of participants to groups
- include demographic information such as sex and age

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concluded based on their research that, “older participants demonstrated intact performance on an indirect test of memory for categories, whereas performance on a direct test for the same information was impaired” (p. 490).

The present experiment compared direct and indirect memory performance for a list of 40 words across older and younger adults. Specifically, words were presented to participants one at a time, visually on a computer screen. For the free recall task, participants were asked to recall, in any order, the words that were presented. For the indirect test of memory, word stems corresponding to words presented on the computer screen and new words were presented, and participants were asked to complete each of the word stems with the first word that came to mind. Based on previous research demonstrating age related declines in performance on direct tests but little or no decline on indirect tests of memory, it was expected that age would influence the direct test performance but would not affect indirect test performance.

Method

Participants

Sixty-four participants were tested in this experiment. Thirty-two of these participants were recruited from the University of Victoria subject pool, and constituted the younger group. Their ages ranged from 18 to 25 years, with a median age of 19 years. There were 18 females and 14 males in the younger group. The remaining 32 participants constituted the older group. These participants were community-dwelling adults recruited

through a subject pool established by the Department of Psychology at the University of Victoria. The ages of this group ranged from 60 to 82 years with a median age of 70 years. The older group consisted of 20 females and 12 males.

Materials and Apparatus

The materials used in this experiment consisted of a list of 40 semantically unrelated nouns, 5 letters in length (see Appendix for a complete list of words used in this experiment). A Macintosh IMAC with a 17-inch colour monitor was used to present the words to the participant.

The words were presented in 16-point font and were written in black on a grey background. For each target word on the list, a word stem was created that consisted of the first two letters of the word, followed by three dashes (e.g., mot--). An additional list of 40 word stems, not corresponding to the list of target words, was also created. The entire set of 80 word stems were typed in 12-point, Helvetica font on an 8 1/2 by 11 inch piece of paper. The words stems were listed on the page in random order.

Procedure

Participants were tested individually in the presence of the experimenter. The words were presented to the participant, one at a time, for 2 seconds. A randomization scheme was used to create a different order of presentation for each participant. Immediately following the presentation of each word, a patterned mask (&&&&&&&) was presented for 2 seconds and then erased. After a 2 second delay, the next word was presented.

2) Materials and Apparatus:

- describes the materials (e.g., word list) and apparatus (i.e., equipment) used and their function
- describe the materials in enough detail that others can replicate
- a copy of the materials can be included in an Appendix at the end of the paper

3) Procedure:

- summarize in detail each step of the procedure in enough detail that the reader could replicate the study

The Procedure should include the following:

- instructions to participants (summarized or paraphrased)
- a description of the formation of groups
- specific experimental manipulations used
- a description of randomization and counterbalancing procedures

Results:

- summarize the data collected and the statistical analyses conducted
- mention all relevant results, even those that run counter to the hypothesis
- present the facts gathered, do not interpret or evaluate them

Hint: Try starting your results section with a statement of your level of significance

Descriptive statistics:

- include a summary of the descriptive statistics (e.g., means and standard deviations of each group)
- these values can be presented in a table or a figure
- when using tables and figures, be sure to refer to them in the text

Inferential Statistics:

- be sure to state the significance level used (this value is known as alpha or the type I error rate)
- include information about the value of the test statistic (e.g., r , t , or F), the degrees of freedom and the obtained p value

Note: statistical notation should be italicized (e.g., r , t , SD , etc.)

Participants were instructed to read each word aloud. Once all 40 words were presented, half of the participants from each age group were given a piece of paper and were asked to write down all the words they could recall. Once this task was complete, the participants were given a second piece of paper containing the 80 word stems, and were asked to complete the word stems with the first 5-letter word that came to mind. For counterbalancing purposes, the remaining half of the participants in each age group were given the tests in opposite order. Participants were then fully debriefed and thanked for their time.

Results

The level of significance set in this experiment was .05. The mean number of words recalled by the Elderly Group was 25.6 ($SD = 2.6$) and the mean number of words recalled in the Young Group was 36.3 ($SD = 1.9$). These data were analyzed using a t -test and the results were statistically significant, $t(62) = 4.36$, $p = .03$, suggesting that younger participants reported more words in the free recall task than the older participants.

The mean number of word stems completed with words from the study phase was 33.9 ($SD = 1.7$) and 32.0 ($SD = 2.1$) for elderly and younger group, respectively. These data were analyzed using a t -test and the results were not statistically significant, $t(62) = 1.19$, $p = .41$, suggesting that the two age groups used an equal number of old words in the stem completion task. See Table 1 and Figure 1 for a summary of the descriptive statistics.

Discussion:

- examine, interpret and qualify the results in terms of the original hypothesis
- open with a clear statement of support or nonsupport for the hypothesis
- discuss the results in terms of previous research (the discussion should link logically with the introduction)
- if (and only if) difficulties arose during the research process, they should be discussed here
- discuss the importance of your findings in terms of implications and applications

Discussion

The hypothesis under investigation in the current report was that older individuals would not perform as well as their younger counterparts on a direct test of memory, but indirect test performance would remain invariant across the two groups. The findings supported this hypothesis.

The current results are consistent with numerous other studies demonstrating that older adults do not perform as well as younger adults on laboratory tasks requiring conscious recollection (Gordon & Clark, 1974) as well as those showing that older adults do not perform well on everyday tasks requiring episodic memory (Gordon & Clark, 1974; Morrell, et al., 1989).

The present findings are also consistent with those that have found comparable performance across younger and older participants on indirect tests of memory (Light & Albertson, 1989; Light & Singh, 1987). Early work on memory and aging has found that older individuals do not perform as well as their younger counterparts on memory tasks. These studies, however, have used episodic memory tests. When memory tasks that do not require this kind of conscious recollection are used to compare the two age groups, older individuals do not show the same kind of decline in performance. The present study also demonstrated this pattern and serves to expand upon previous research studying the effects of aging on memory.

The results also have important implications for memory improvement among the elderly. With knowledge that older individuals do not perform as well as their younger counterparts on direct tests, this specific group can be shown ways to improve direct test performance through elaborative methods.

References:

- all citations used in the paper must appear in the reference list, and all papers in the reference list must appear in the paper
- the reference section begins on a new page with 'References' centered at the top
- each work is distinguished by a hanging indent (the first line is flush with the left margin, and subsequent lines are indented)

Creating the reference list:

- the list is alphabetized by the first authors' last names
- if a single author has more than one work, put the works in order of year, beginning with the earliest
- works by a single author precede works with more than one author with the same last name
- works with the same first author and with different additional authors are ordered by the name of the second author

Note: never change the order of authorship within a reference

Types of References:

Journal article with DOI
—————>

Chapter in an edited book
—————>

Journal article without DOI (online version) —————>

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References

Gordon, S. K., & Clark, W. C. (1974). Application of signal detection theory to prose recall and recognition in elderly and young adults. *Journal of Gerontology, 29*, 64-72.

Light, L. L., & Albersen, S. A. (1989). Direct and indirect tests of memory for category exemplars in young and older adults [Abstract]. *Psychology and Aging, 4*, 487-492.

Light, L. L., & Singh, A. (1987). Implicit and explicit memory in young and older adults. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 13*, 531-541.

Maylor, E. A. (1990). Recognizing and naming faces: Aging, memory retrieval, and the tip of the tongue state. *Journal of Gerontology: Psychological Sciences, 45*, 215-226.

Maylor, E. A. (1991). Recognizing and naming tunes: Memory impairment in the elderly. *Gerontologist, 46*, 207-217.

Morrell, R. W., Park, D. C., & Poon, L. W. (1989). Quality of instructions on prescription drug labels: Effects on memory and comprehension. *Gerontologist, 29*(2), 345-354. doi:10.1037/5555-2315.111

Rabinowitz, J. C., & Ackerman, B. P. (1982). General encoding of episodic events by elderly adults. In F. I. M. Craik & S. Treub (Eds.), *Aging and cognitive processes* (pp. 145-154). New York, NY: Plenum.

Ruber, M. (2002). Memory and comprehension as we age. *Journal of Learning and Memory, 12*(3), 444-457. Retrieved from <http://www.ojs.lib.swin.edu.learning/index.com>

Journal article without DOI
(print version) →

Tulving, E. (1985). How many memory systems are there? *American Psychologist*, 40, 385-398.

Web page no author
→

Understanding aging and memory in modern times. (1999). Retrieved from
<http://www.ucl.ac.uk/~ucbt dag/iha/>

Secondary source
(include the reference
of the secondary
source in the
reference list, not the
original source) →

Ying, P. L. (2001). Memory for daily activities in the elderly. *American Journal of Geriatric Psych*, 21, 21-36.

* **Note:** For additional
referencing examples visit
[camosun.ca.libguides.com](http://camosun.ca/libguides.com)

Tables:

- present data in a clear format
- they should supplement the text, not duplicate it
- tables are numbered 1, 2, 3, etc. and need to be referred to in the text by their number

Creating a table:

- the table is on a new page after the references
- give the table a clear but brief title (italicized) - use exact numerical values
- use double spacing and horizontal lines

Table 1

Means (and Standard Deviations) of Memory Test Scores for Elderly and Young Adults in the in the Recall and Stem Completion Tests.

	Age	
Test	Young	Elderly
Recall	36.3 (1.9)	25.6 (2.6)
Stem Completion	32.0 (2.1)	33.9 (1.7)

Figures:

Note: in APA style any illustration other than tables are referred to as figures

- figures present the data in an easy to understand, visual format
- they need to be self contained
- they are numbered 1, 2, 3, etc. and need to be referred to in the text by their number

Figure:

- the figure is placed above the figure caption

Figure caption:

- serves as both an explanation of the figure and as a title
- it should be a brief, descriptive phrase
- it goes below the figure

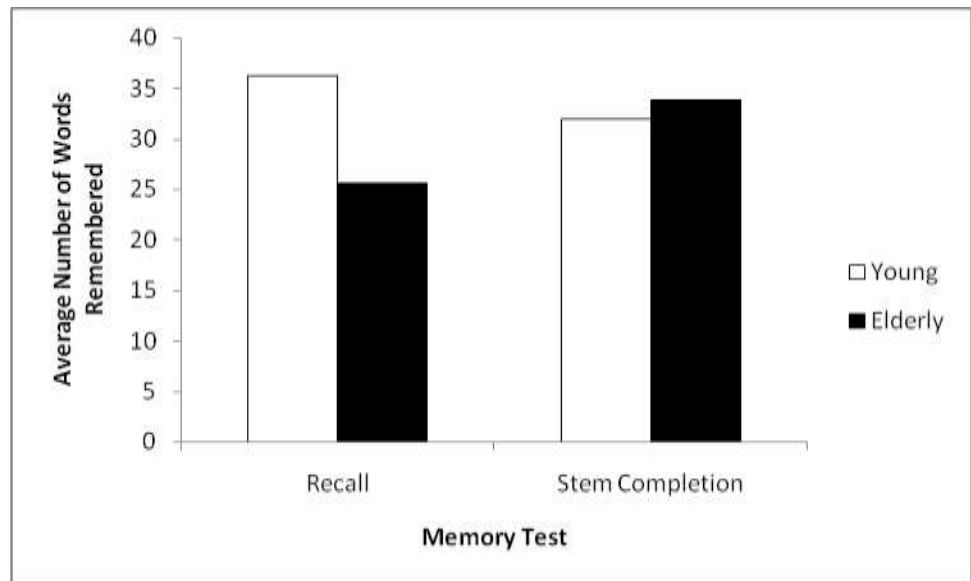


Figure 1. The mean number of target words recalled in the recall and stem completion memory tests by young and elderly participants.

Appendix:

- it provides the reader with detailed information that would be distracting in the paper
- can be used to present the entire list of stimuli used in the experiment

Creating an Appendix:

- if you have only one appendix, label it 'Appendix'; if you have more than one appendix, label each with a capital letter (e.g., Appendix A) in the order that they are mentioned in the text
- the appendices should be referred in the text by their label
- it starts on a new page with 'Appendix' centered at the top
- the appendix must have a title

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Appendix

The list of words used in the experiment.

House	Party
Kayak	Shade
Cheek	Flake
Purse	Smile
Chair	Phone
Horse	Blade
Shirt	Cliff
Motel	Sword
Steak	Wafer
Radio	Cloak
Flank	Notch
Shark	Flame
Field	Stamp
Glass	Igloo
Paper	Camel
Medal	Stool
Eagle	Board
Money	Clamp
Music	Jewel
Grass	Drink