

Formatting the Document:

- margins 1 inch on all sides
- entire document double-spaced
- use Times New Roman (12 point), Calibri (11 point) or Arial (11 point); use the same font throughout entire paper
- indent the first line of every paragraph (except abstract)
- use a single space after punctuation (including the end of a sentence)
- all section headings are bolded and typed in title case (main words in uppercase)
- every page has a header which includes: a) running head (abbreviated title; max. 50 characters) written in all uppercase at top left of page; and b) page number at top right of page

Title Page contains four elements:

1. Header: a running head (abbreviated title) typed in uppercase and page number
 2. Title: typed in title case (upper and lowercase letters), centered between left and right margins and positioned ~ 4 double-spaced lines from the top of the page
 3. Authors: centered below title
 4. Department and Institution Affiliation: centered below authors
- * One blank double-spaced line between the title and author(s)

Title:

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

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The Effect of Aging on Memory

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Hints on writing the paper:

- use first person active voice when referring to the actions of the author (experimenter)
- use past tense throughout the paper except in parts of the discussion section

Abstract:

- brief, comprehensive summary of the paper
- allows readers to survey the contents of the paper quickly
- maximum 250 words
- it is on its own page, as single paragraph (not indented) with 'Abstract' bolded and 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:

- very brief description of the method (including pertinent information about participants, materials, procedures, and design)
- the hypothesis under investigation
- 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

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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 implications for current theories of memory.

Introduction:

- introduces the problem under investigation, reviews previous research on the topic, and describes the research strategy (including hypothesis)
- begins on a new page with the title of the paper bolded and centered at the top

The Introduction includes:

- a broad overview of the research area/terms
- a description of relevance/importance of research
- a review of relevant literature/theory (include in-text citations)
- a brief discussion of how the current research was conducted
- a description of the variables in the current study and the hypothesis under investigation
- the rationale for the current hypothesis

Note: do not discuss your results in the introduction

Citations in Text:

- when there are **one or two authors**, cite the author's last name(s) and year every time the citation occurs
- when there are **three or more authors**, cite the first author's last name followed by 'et al.,' and the year
- two types of citations:
 - a) **Parenthetical:** include both the author's name(s) and year in parentheses; use & for two authors
 - b) **Narrative:** include the author's name(s) in the text part of the sentence and put the year in parentheses; use the word 'and' for two authors

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 (e.g., 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 participant to consciously recollect a previous episode. Previous studies comparing episodic memory abilities in younger and older adults have typically demonstrated that older individuals do not perform as well as their younger counterparts, particularly on tests involving the free recall of information (Rabinowitz & Ackerman, 1982). There is a plethora of research exploring this discrepancy. For example, Gordon and Clark (1974) found that older adults had impaired performance in free recall for words and prose, as well as cue recall for paired associates.

In Text Citation Examples:

Multiple citations within parentheses: place citations in alphabetical order by first author's last names, separating them with a semicolon

More than two authors: cite the first author's last name followed by 'et al.,' and the year

Secondary sources: provide the author(s) and year of the original work followed by "as cited" and then the author(s) and year of the secondary source. Only the secondary source will appear in the references

Work with No Author: cite the title followed by the year (always use title case); place article titles in quotations and italicize book and webpage titles

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 (Light & Albertson, 1989; Morrell et al., 1989). For example, findings observed in laboratory studies designed to replicate real life experiences suggest that older individuals have more difficulty 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, 2001, as cited in Ying et al., 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 (*Understanding Aging and Memory*, 1999). 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 test 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. Light and Singh (1987) conducted an experiment comparing the performance of younger and older participants on an indirect test. 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 made 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 four subsections

1) Participants:

- include a description of the selection of participants to groups
- include demographic information such as gender and age; use bias-free language to describe participants

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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 individuals participated 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. In the younger group, 18 of the participants identified as cisgender women and 14 as cisgender men. The remaining 32 participants constituted the older group. These participants

were community-dwelling adults recruited from the University of Victoria subject pool. The ages of this group ranged from 60 to 82 years with a median age of 70 years. In the older group, 18 of the participants identified as cisgender women, 12 as cisgender men, and two as transgender woman.

Materials

The materials used in this experiment consisted of a list of 40 semantically unrelated nouns, five letters in length (see Appendix A 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., mo---). An additional list of 40 word stems, not corresponding to the list of target words, was also created (see Appendix B for a complete list of the word stems used in this experiment). 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

I approached each participant individually and asked if they would like to participate in a memory experiment. If the participant agreed to participate, their ethical rights were reviewed and informed consent was obtained. Participants were told that the words would be presented to them one at a time for 2 seconds and they were instructed to read each

2) Materials:

- 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 includes:

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

word aloud. The words were presented in a different order 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. 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, these 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. 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.

Design

A quasi experimental design was used where participants were assigned to groups based on their age (i.e., older and younger). Half of the participants in both the younger and older groups received the free recall test first and the stem completion test second and the other half of the participants received the tests in the opposite order.

Results

The level of significance set in this experiment was .05. The mean number of words recalled by participants in the older group was 25.63 ($SD = 2.62$) and the mean number of words recalled by participants in the younger group was 36.31 ($SD = 1.98$). See Figure 1 for a summary of the descriptive statistics. These data were analyzed using a t -test and the results

4) Design:

- include a description of the research design used in your study (i.e., between-subjects; within-subjects)

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

Level of Significance:

- Begin with a statement of the level of significance (alpha) you set

Descriptive statistics:

- include a summary of the descriptive statistics (e.g., means and standard deviations of each group/condition)
- you can summarize the descriptive statistics (i.e., means) in a figure
- refer to your groups/conditions using meaningful names (**not** group A/B or experimental/control)
- when using tables and figures, be sure to refer to them in the text

Inferential Statistics:

- state what type of test was used and 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 , p , etc.)

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were statistically significant, $t(62) = 4.36$, $p = .031$, suggesting that younger participants reported more words in the free recall task than the older participants.

The mean number of target word stems completed by participants in the older group was 33.97 ($SD = 1.71$) and the mean number of target word stems completed by participants in the younger group was 32.03 ($SD = 2.14$). These data were analyzed using a t -test and the results were not statistically significant, $t(62) = 1.19$, $p = .410$, suggesting that the two age groups used an equal number of old words in the stem completion task.

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

Discussion:

- examine, interpret and qualify the results in terms of the original hypothesis

When writing the Discussion you should:

- begin by restating your hypothesis and then make a clear statement of the support or non-support of your original hypothesis
- discuss the results in terms of previous research (the discussion should link logically with the introduction; use in-text citations)
- discuss any difficulties, if and only if, they arose during the research process and how they could be improved
- discuss the importance of your findings in terms of strengths, theoretical implications and practical applications
- propose suggestions for future research and why/how these directions are important

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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 encoding 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 and bolded
- 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

Journal article without DOI

(retrieved online from a common database, such as PsycINFO)

Chapter in an edited book with more than one edition

References

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Journal article without DOI
(print version)

→ Ruber, M. (2002). Memory and comprehension as we age. *Journal of Learning and Memory*, 12(3), 444-457.

Book

→ Tulving, E. (1985). *How many memory systems are there?* Chelsea Green Publishing.

Webpage no author

(only include a retrieval date if the content is likely to change overtime; e.g., Retrieved January 2, 2019, from <http://xxxx.com>)

→ *Understanding aging and memory in modern times*. (1999). University College London. <http://www.ucl.ac.uk/~ucbtdag/iha/>

Secondary source

(include a reference for the secondary source in the reference list; do include a reference for the original source)

→ Ying, P. L., Sampson, D., Singh, T. G., Lui, X., Moore, D., Beattie, A., Hutchin, M., Sanchez, M., Hall, M. D. D., Powell, C., Moore, Y., & Hernandez, T. (2001). Memory for daily activities in the elderly. *American Journal of Geriatric Psychology*, 21(10), 21-36.

Figures:

Note: in APA style graphs 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 Number:

- assign the figure a number based on the order that it is mentioned in the text
- write the word **'Figure'** and the number in bold at the top left side of the page

Figure title:

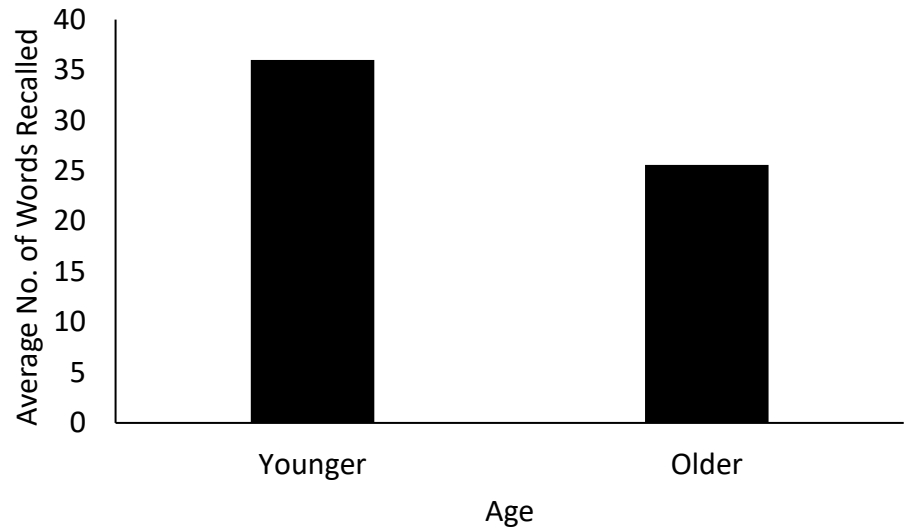
- it should be a brief, descriptive phrase
- write the title in italics and title case (upper and lower letters)
- it goes above the figure

Figure:

- left-justify the figure
- use meaningful labels for both the x and y axes
- remove gridlines

Figure 1

Free Recall Test Scores for Younger and Older 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 and bolded
- the appendix must have a title; the title appears below the label and is centered and bolded

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Appendix A

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

Appendix B**List of Word Stems Used in the Experiment**

Ho---	Pa---	Ba---	Ha---
Ka---	Sh---	Sa---	Qu---
Ch---	Fl---	Ma---	Nu---
Pu---	Sm---	Se---	Fo---
Ch---	Ph---	Co---	Cu---
Ho---	Bl---	Le---	Pa---
Sh---	Cl---	Ke---	Mi---
Mo---	Sw---	To---	Pr---
St---	Wa---	Bo---	Pe---
Ra---	Cl---	Um---	Ze---
Fl---	No---	Ha---	Re---
Sh---	Fl---	Cu---	Ba---
Fi---	St---	Ny---	Ti---
Gl---	Ig---	At---	Da---
Pa---	Ca---	Bi---	Oc---
Me---	St---	Ru---	Ne---
Ea---	Bo---	Ci---	Hi---
Mo---	Cl---	Do---	Ta---
Mu---	Je---	Fa---	Au---
Gr---	Dr---	He---	Mo---