

Name

Professor

Class

Date

Literature Review/Ratcliff et al.

1. What is/are the main objective(s) of this study?

The main objective of this study is to determine if there is a correlation between age (college age vs. older/60-75 years of age) and processing speed, as measured by response time (RT), on two lexical-decision experiments.

2. What previous work motivated the present study?

Numerous studies support a negative correlation between processing speed and age on a range of cognitive tasks; processing speed slows as age increases. While one would expect processing time for lexical-decision tasks, which are dependent on exposure to words, to decrease for older individuals, studies have shown this not to be the case. In a prior study, three of the authors of the present study used the diffusion model for two-choice decision, which allows analysis of distinct processing components, to evaluate the results of nine lexical-decision experiments. The model explained the resulting data well. In the present study, the authors use the same model to examine the effect of age on these components of lexical-decision performance.

3. Does the author state a specific hypothesis? If so, what is the hypothesis (or hypotheses)?

The authors hypothesize that the difference in RT to lexical-decision tasks between the young and older participants is due, in part, to the more conservative criteria that older subjects use in the decision making process as well as slower nondecision components

(such as encoding and response execution) of the process that are not related to accumulation of evidence.

4. If the author(s) does not explicitly state a hypothesis, does he/she have a clearly defined question? If so, what is the question?

See hypothesis above.

5. How does the author(s) test her/his hypothesis or address the research question?

The authors designed two experiments to test the hypothesis. Participants in both experiments consisted of college students (young adults) and local residents (older adults) who were determined by a screening process to be free of symptoms of cognitive impairment or psychiatric disorders. Authors recruited a total of 98 participants for Experiment 1 and 94 participants for Experiment 2. Following the screening process, accepted participants were given a practice experimental task and asked to return in one week to complete the task. The authors used three categories of words in both experiments: high-, low-, and very-low frequency. In both experiments, participants were presented with a string of letters on a computer screen that constituted either an actual word or a faux word, and asked to press a key to indicate whether or not the stimulus was a real word. In Experiment 1, the faux words were pronounceable and in Experiment 2, they were unpronounceable. A number of different statistical procedures were used to analyze the data, including Brinley plots, quantile probability functions, ANOVAs and chi-square computations. The results supported a longer RT for the older participants in both experiments, and a longer RT for very low- and low-frequency words than for high-frequency words.

6. What do those results indicate? Are the findings supportive of the proposed hypotheses?

Supporting the authors' hypothesis, the results indicate that the slower RT on a two-choice task like the lexical-decision tasks used in this study may be determined by some, rather than all, of the components of processing that differ in young and older participants, such as the type of decision criteria that the individual sets, and nondecision components.

7. In the opinion of the author, what are the implications of the study?

The authors conclude that the diffusion model is a useful tool for analyzing variation in two-choice decision tasks, and should be employed in future research in this area.

8. In your opinion, what are the implications of this study?

The results support that despite their longer exposure to words, older people exhibit a slower RT on two-choice lexical-decision tasks than do younger people. This is probably due to the higher criteria that older people set for decision making, and slower nondecision processes such as encoding and response execution. The implication is that cognitive processing, at least on a basic level such as in this two-decision task, consists of a number of components, which may affect the speed of the whole process.

9. In your opinion, what are the strengths and weaknesses of this study?

The methodology and data analysis in this study appear to have been well designed and executed. In future studies on this subject, other variables that may impact processing speed, such as time of day of task completion and whether participants have ingested caffeine or sugar prior to testing, should be included in the analysis.