The Effect of Age on False Memory Recall and Recognition

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False Memory

- False memory has been defined by the Oxford Dictionary (n.d.) as a distorted recollection of an event which never occurred, and may be due to the incorporation of new information.

- For example, if an individual viewed a list containing words like “awake, alarm, blanket” and remembered “sleep” being on the list, they would be recalling a false memory. Sleep was not on the actual list, but the list contained words that often accompany sleep.
Researchers

• James Deese was one of the first researchers to fully study false memories in individuals (Deese, 1959).

• Since then, researchers Roediger and McDermott have studied false memories using the Deese-Roediger-McDermott paradigm, which refers to the predisposition to falsely recall a target word from a list of words centered around the actual target word.
Theories of False Memory

• According to the activation-monitoring framework, false memories occur because information that is not directly given during the encoding portion of the experiment may still be inferentially activated and processed by the participant. (Cann, McRae & Katz, 2011).

• Another theory central to the cause of false memory is fuzzy-trace theory, which states that memories are based on verbatim traces and gist traces. These traces operate parallel with one another, but verbatim traces focus on the surface details, while gist traces focus on the semantic content. According to fuzzy-trace theory, false memories are formed when gist traces are used during encoding (Cann, McRae & Katz, 2011).
Do Older Adults Recall and Recognize More False Memories than Younger Counterparts?
Method

- Three groups were tested in the current experiment, including young adults ages 18-22 (mean age 20), middle-aged adults, ages 30-60 (mean age 52.2), and older adults, ages 65 and older (mean age 68.4).

- 22 of the participants were male, while 23 were female.

- These participants were recruited from a local café.
Procedural Points

- Each participant was shown a list of ten words using a computer program which allowed each word to be shown on a timer in two-second intervals.
- After viewing the list, the participant was asked to recall and write down as many words as possible.
- After completion of the recall portion, the participants repeated the list viewing/recall portion two additional times.
Procedural Points

- Once each participant viewed 3 lists (30 words), and completed the recall portions for each list, they were ready to move on to the recognition portion of the study.

- A list of 39 words was given to each participant, (30 being the previously presented words, and 9 being the critical lures).

- Individuals were asked to identify which words had appeared on the previous 3 lists.
Sample List

- Bed
- Rest
- Sleep
- Awake
- Pillow
- Snooze
- Doze
- Blanket
- Alarm
- Tired
- Dream
- Snore
- Slumber

*Red text denotes critical lure*
Results of Recall Portion

In the young adult condition, the mean number of words falsely recalled was .60 ($SD= .75$).

The average number of words falsely recalled in the middle-aged adult condition was .87 ($SD= 1.06$).

In the older adult condition, the mean number of words falsely recalled was 1.53 ($SD= 1.02$).
Results of Recognition Portion

In the young adult group, the mean number of words falsely recognized was 1.13 ($SD= 1.02$).

In the middle-aged adult group, the mean number of words falsely recognized was 2.53 ($SD= 1.19$).

The mean number of words falsely recognized in the older adult group was 3.87 ($SD= 2.00$).
Overall Results: Recall

- Using a one-way analysis of variance in SPSS, it was determined that there was a significant main effect for age in the number of words recalled, $F(2,42)=3.73$, $p=0.032$.

- A post hoc analysis using Tukey HSD showed that older adults falsely recalled more words than young adults in the false recall portion.
Overall Results: Recognition

- A one-way analysis of variance also showed a significant age main effect in the number of words falsely recognized, $F(2,42)= 13.50, \ p= .00$.

- A post hoc analysis using Tamhane showed the rate of false recognition was higher for middle adults and older adults when compared with young adults.
• One framework that explains the inaccuracy of age-related memory is the dual-process model. In the dual-process model, individuals use an implicit, unconscious process as well as an explicit, conscious process in memory. This model suggests that older adults have an inability to recollect specific events, thus they are more susceptible to false memories. Because of this recollection inability, some older adults may see easily accessible information as being a true memory (Jacoby & Rhodes, 2006).
In this model, the implicit process refers to habit, as the explicit process refers to recollection. Older adults showed a diminished rate of recollection, showing they rely on habit more often, resulting in higher rates of false memories (Jacoby & Rhodes, 2006).
Discussion

• Another explanation of the current study’s results may be attributed to the activation-monitoring framework, in which, higher rates of older adults inferentially process information, creating false memories. Similarly, according to fuzzy-trace theory, older adults in the current study may have focused more on the semantic content than the surface details. The results of the current study were in agreement with previous research on the effect of age on false recall and recognition (Gras, Tardieu, Piolino & Nicolas, 2011; Jacoby & Rhodes, 2006).
Discussion

• According to the results of the functional magnetic resonance imaging (fMRI), there were major differences in activity locations in older adults when compared with younger adults. Older adults had weak activity in their hippocampus, which is associated with common age-related recollection deficits (Dennis, Kim & Cabeza, 2008).
Discussion

- When older adults falsely recognized critical lures, their fMRI scans showed stronger activity in the left lateral temporal cortex, which is an area that is strongly involved in semantic processes and gist traces (Dennis, Kim & Cabeza, 2008).
• Although older adults may have difficulty when they are asked to recall memories in their surface form (i.e., the actual word), they are still able to utilize the most important part of memory, which is comprehension of the text. (Gras, Tardieu, Piolino & Nicolas, 2011).


Image References


