



The Combination of Organization and Emotion: An Immediate Free Recall Task

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Abstract

Both organization (e.g., semantic-relatedness) and emotional valence have been found to lead to better memory as seen through the superior recall of semantically-related⁵ and emotionally-valenced lists⁷. However, research suggests that these two factors may not only lack an additive effect when combined, but may result in worse recall. Based on this research, we hypothesized emotion would hinder recall of a semantically-related list by impairing the relational processing that usually benefits recall of semantically-related material. This hypothesis was supported, as it was found that emotional valence resulted in reduced recall in a semantically-related list. This finding may have important implications for fields like education and advertising, where the use of emotional stimuli within a message could cause a person to miss its bigger picture.

Background Studies

- Organized information has been found to contribute to greater recall in a variety of populations⁵
- Words of either positive or negative emotional valence are remembered better than neutral words⁷
- Organized emotional words are recalled worse than organized neutral words in some studies⁶ but better in others²

Purpose

The purpose of this study was to:

- Provide clarity to past research which has found conflicting results in regard to the combination of semantic relatedness and emotion in free recall
- Provide evidence for a common mechanism to explain the combination of semantic relatedness and emotion in memory
- Determine if the previously found detrimental effect of emotion on semantic relatedness at a relatively fast presentation rate can be replicated at a slower presentation rate of 1000 ms/word

Participants

Seventy-two (50 women, 22 men, *M* age = 18.87) undergraduate college students participated in this study.

Materials and Procedure

Word List Task:

- Each participant viewed 4 word lists: a semantically-related neutral list, a semantically-related emotional list, a non-semantically-related emotional list, and a non-semantically-related neutral list
- Participants were instructed to recall as many words as they could immediately following the presentation of each word list

Raven's Matrices Task:

- Each participant completed as many Raven's matrices puzzles as possible for 5 minutes following each recall session in order to eliminate possible lingering effects of emotion

Sample Words

Categorized Neutral	Categorical Emotional	Uncategorized Emotional	Uncategorized Neutral
Sleep	Kill	Abuse	Apple
Dream	Murder	Dangerous	Garage
Tired	Stab	Hate	Mouse

Main Hypothesis

Our hypothesis was that a combination of semantic relatedness and emotion will lead to impaired recall. Semantic relatedness has been hypothesized to enhance recall because semantically-related words share a common pattern, or gist trace¹. However, emotional stimuli have also been hypothesized to gain priority in memory⁴ – a process that may in fact impair relational or gist trace processing. Furthermore, this effect is predicted at a 1000 ms/word presentation, which has been found to fall within the time that gist trace connections are being processed³. Thus, if emotion does impair relational processing, such that the full benefit of semantic-relatedness during recall is diminished, participants should have greater recall for semantically-related neutral words compared to semantically-related emotional words. Furthermore, participants should also have a higher amount of semantically-related intrusions for semantically-related neutral words compared to semantically-related emotional words, as this measurement indirectly indicates how well a semantic pattern is recognized.

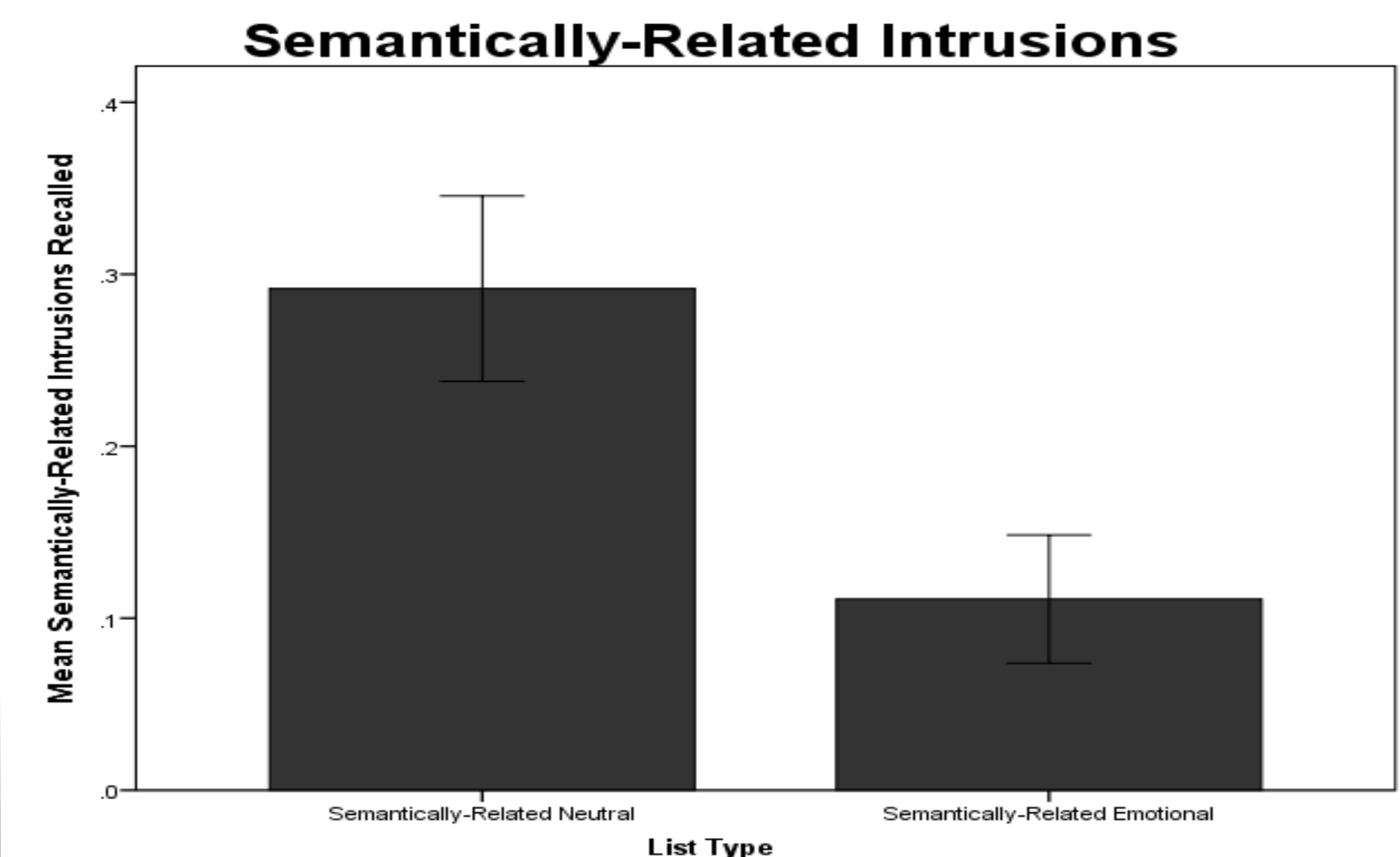
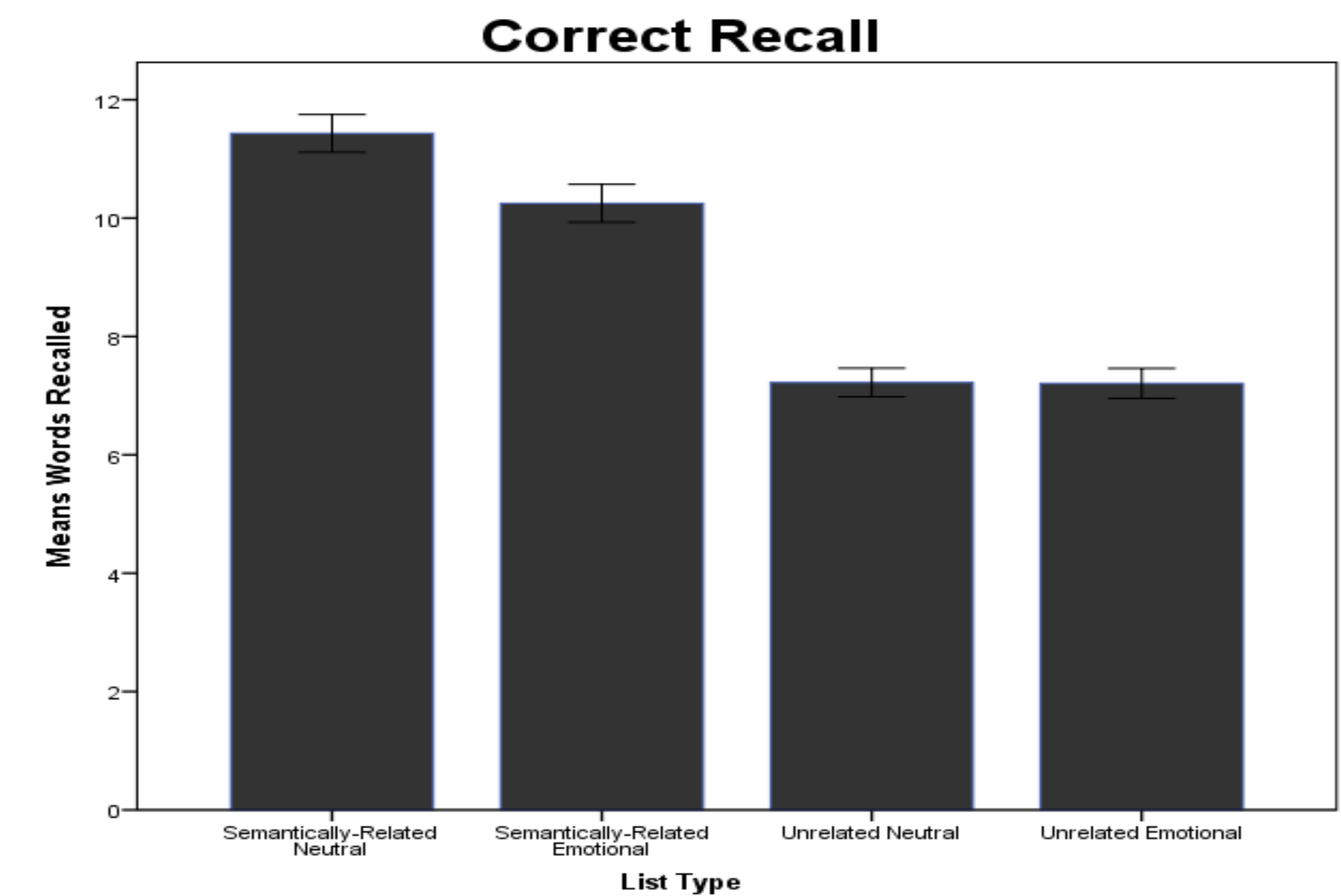
Results

Correct Recall

- Significant interaction found between semantic relatedness and emotion, $F(1, 71) = 6.75, p < 0.02$, such that emotion impaired recall for semantically-related words but not for unrelated words.
- Main effect found for semantic relatedness $F(1, 71) = 263.56, p < 0.01$: Semantically-related lists ($M = 10.84$) > unrelated lists ($M = 7.21$)
- Main effect found for emotion $F(1,71) = 7.49, p < 0.01$: neutral lists ($M = 9.33$) > emotional lists ($M = 8.73$)

Semantically-Related Intrusions

- Semantically-related neutral word list ($M = 0.29$) > semantically-related emotional word list ($M = 0.11$), $p < 0.05$



Conclusions

We proposed that emotion would adversely affect recall for semantically related words. Consistent with this hypothesis, the semantically related emotional list was recalled worse than the semantically related neutral list. Furthermore, the significant interaction between semantic-relatedness and emotion showed that the ability of semantic-relatedness to increase recall is decreased when paired with emotion. Additionally, the greater semantically related intrusions of the semantically related neutral list indicates that its semantic pattern was more salient compared to that of the semantically related emotional list, lending support to the theory that emotion impairs relational processing.

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