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Introduction

Semantic priming refers to a simple observation: the processing of a stimulus, called the target, can be facilitated if preceded by a related (vs. unrelated) stimulus, called the prime¹. Semantic priming effects are typically reflected on the N400 ERP component, signifying that associated targets are facilitated during lexico-semantic processing. We asked whether affective priming (the facilitation of emotionally related stimuli) relies on the same mechanism.

To do so, we implemented a full crossing of semantic priming ("Association": associated vs. unassociated) and affective priming ("Relationship Type": same valence vs. opposite valence) in a large set of emotional word pairs, with an equivalent number of comparable neutral fillers.

We expected semantic priming to modulate the N400, with associated words eliciting a smaller negativity than unassociated words². If affective priming and semantic priming share the same lexico-semantic mechanism, we then expected to see a similar N400 of affective priming.

¹Neely, J. H. (1976). Semantic priming and retrieval from lexical memory: Evidence for facilitatory and inhibitory processes. *Memory & Cognition*, 4(5), 644-654. doi:10.3758/BF03193209

²Berlin, S., McCarthy, G., & Wood, C. C. (1985). Event-related potentials, lexical decision and semantic priming. *Electroencephalography and Clinical Neurophysiology*, 65(4), 343-356.

Results

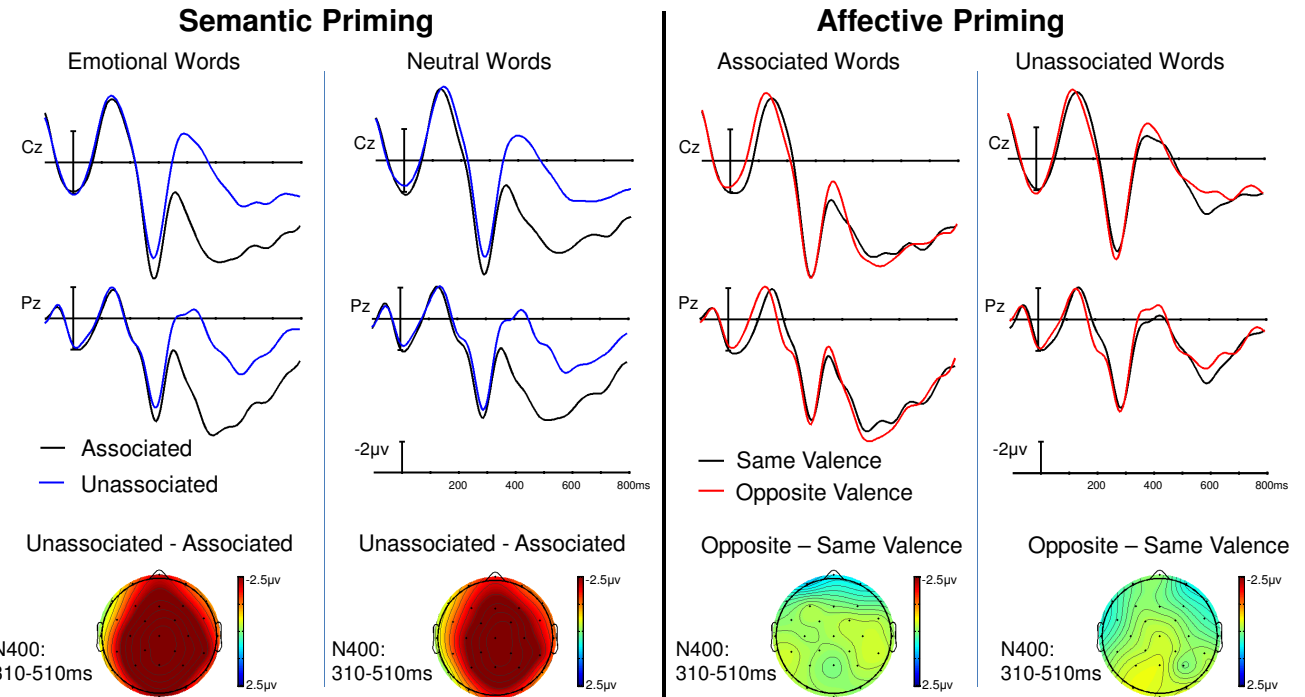


Figure 1: Both emotional words and neutral words showed a large effect of semantic priming on the N400 component, with associated words eliciting a smaller negativity than unassociated words. In contrast, we found no evidence of affective priming on either the N400 or late positivity.

Methods

Table 1 – Design and Example Stimuli

Target Emotion	Association	Relationship Type	Example
Unpleasant target	Associated	Same valence (Synonym)	Devil - Demon
		Opposite valence (Antonym)	Angel - Demon
	Unassociated	Same valence	Uptight - Demon
		Opposite valence	Relaxed - Demon
Neutral target	Associated	Neutral valence (Synonym)	Beneath - Under
		Neutral valence (Antonym)	Over - Under
	Unassociated	Neutral valence	Combine - Under
		Neutral valence	Separate - Under

Table 2A – Properties of the Primes

	Word Length	Freq.	Ortho. Freq.	Bigram Freq.	Concret-ness	Valence	Arousal	Association Strength
Unpleasant Synonyms	5.98	8.56	6.96	3547	3.43	2.22	3.94	0.245
Pleasant Antonyms	5.35	10.06	7.62	3831	3.63	5.62	4.04	0.230
Neutral Synonyms	5.48	9.62	7.90	3350	3.77	3.99	3.31	0.197
Neutral Antonyms	5.33	10.61	7.26	3638	3.88	4.05	3.13	0.200

Table 2B – Properties of the Targets

	Word Length	Freq.	Ortho. Freq.	Bigram Freq.	Concret-ness	Valence	Arousal
Unpleasant Targets	5.05	9.49	7.16	3630	3.67	2.12	3.97
Neutral Targets	5.3	10.59	7.66	3337	3.91	3.96	3.30

Conclusions

Though semantic priming elicited a robust N400 effect, we saw no effect of affective priming on the N400, either for associated emotional words (e.g. "devil...demon" vs. "angel...demon") or unassociated emotional words (e.g. "uptight...demon" vs. "relaxed...demon"). These results suggest that, at least under task and experimental conditions that encourage semantic associative processing, affective priming does not influence lexico-semantic processing.

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