



Transfer of negative emotion in episodic memory



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Introduction

Among the myriad of effects of emotion on memory, one consistently observed finding is that **negative emotion weakens memory binding**: Memory for associations between the elements that comprise an episode is attenuated in the presence of emotional information (e.g., Mather, 2007, Perspectives in Psych Sci)

This effect is typically observed when **negative and neutral items are presented in pairs** (e.g., Madan et al., 2017, NeuroImage)

Presence of a negative item can also **disrupt subsequent encoding of novel items** when an overlapping neutral item is presented again in conjunction with a novel stimulus (e.g., Bisby et al., 2017, JEP:General).

This leads to the intriguing hypothesis that the effects of negative emotion on binding are not uniform. Does the valence of negative experiences “bleed over” to novel experiences?

Hypothesis 1: Negative emotion weakens associative binding in 1st and 2nd order learning (replication)

Hypothesis 2: Negative affect gets bound to neutral information in 1st and 2nd order learning (“transfer of valence”)

Hypothesis 3: The transfer of valence effect is correlated with trait anxiety

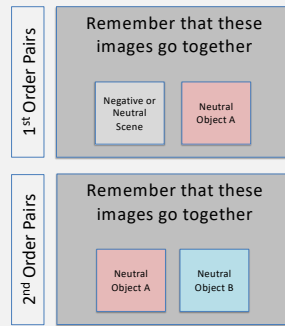
Participants

N=79 undergraduate students at the University of British Columbia who registered through the Human Subject Pool; one participant excluded (>3SD from the mean), resulting in **N=78** (53 female; mean age 20.7)

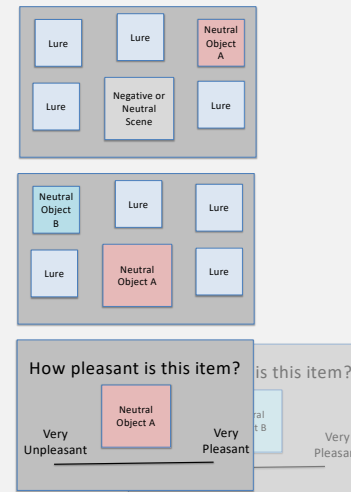
Participants also completed the State-Trait Anxiety Inventory (STAI) and the Beck Depression Inventory (BDI)

Methods

Encoding



Retrieval (10 min delay)



- Stimuli
- Scenes (negative or neutral): Nencki Affective Picture System (NAPS; Marchewka et al., 2014)
 - Objects (neutral): Bank of Standardized Stimuli (BOSS; Brodeur, Guérard, & Bouras, 2014)

Conclusions

Neutral information ‘inherits’ the emotional valence of negative adjacent items, and this effect occurs vis-à-vis poor associative memory.

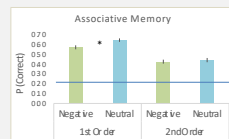
Consistent with some theoretical models, we suggest that the above co-occurring mnemonic processes may contribute to the “decontextualization” of emotional memories (see Bisby & Burgess, 2017, Current Opin Behav Sci).

Contrary to our hypothesis, we did not observe carry-over effects for 2nd order pairs (wherein a neutral co-pair is encoded with yet another neutral item).

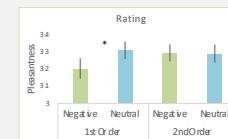
Individual-difference analysis suggest that the transfer-of-emotion phenomenon (at the 1st order) may be a relevant phenotype for understanding trait anxiety. This finding requires replication (underway with preregistration).

Results

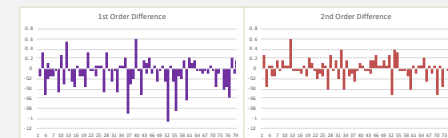
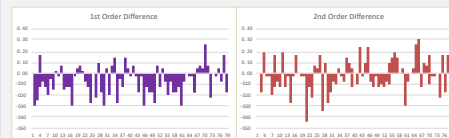
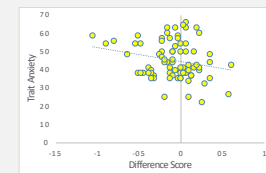
Hypothesis 1



Hypothesis 2



Hypothesis 3



Associative memory is reduced when one of the co-pairs is negative (in 1st order pairs only) Interaction $p = .01$

Neutral information paired with a negative scene is subsequently rated as less pleasant—a “transfer of valence” effect (in 1st order pairs only) Interaction $p = .003$

Individuals with higher trait anxiety show the largest transfer of valence effect (in 1st order pairing) $r = -.22, p = .049$

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