A Garden Full of Angry Bees:
Effects of Context on Emotional Valence

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Abstract

There are several excellent databases exploring characteristics like emotional valence in individual words, with perhaps the most well-known being Bradley & Lang's ANEW database. However, such databases are limited by the fact that the studies that produce them have participants rate the words without context. We performed a partial replication of Bradley & Lang's 1999 study, placing 90 emotional nouns (45 negative, 45 positive) in negative and positive contexts. We found strong evidence to suggest that emotional context that conflicts with a noun's out-of-context emotional valence can cause a significant shift in participants' perception of that noun.

1. Introduction

Controlling for emotional valence is common practice when studying various aspects of language processing in the brain, and rightfully so; there is substantial evidence of the effects of emotion on the processing of both semantics (Federmeier, et al., 2001; Martín-Loeches, et al., 2012) and syntax (Martín-Loeches, et al., 2012; Palazova, et al., 2011). When controlling for arousal and emotion, researchers often turn to databases like Bradley & Lang's (1999) Affective Norms for English Words (ANEW). In the ANEW database, several characteristics are shown: arousal, frequency, dominance, and, most relevant to the current study, emotional valence.

Many words are inherently emotional. A word like "dessert" usually evokes feelings of delight, enjoyment, and happiness, while a word like "torture" likely inspires extremely different feelings. Back in 1980, Peter Lang developed the Self-Assessment Manikin (SAM), a scale ranging from 1–9 (1 being indicative of negative feelings, and 9 being indicative of positive feelings; see Appendix A for details), to operationalize emotions in language (1980). In theory, these databases are excellent resources for researchers looking to control for various aspects of language. In practice, that goal may be more difficult to achieve than it would seem.

To create their database, Bradley & Lang had university students in Florida rate roughly 1,000 words (100–150 in any given experiment) on a few key metrics, including emotional valence, using their SAM scale. This was incredibly ambitious, setting the gold standard for databases of this style, and being replicated in multiple other languages (e.g., Redondo et al., 2007). However, this study does have a couple flaws. First, with the ratings being done on individual words that were presented out of context, any attempt to use this database (or others like it) to control for valence in contextual settings may be problematic. Second, there is no guarantee that this database can provide insight into how an individual subject will perceive a word; while large-scale studies like this can examine general sentiments around language when looking at the level of populations, the standard deviations included in the ANEW database indicate that responses varied significantly between subjects.

It is clear that emotional context is important for language processing, whether in the realm of syntax or semantics. For a couple examples (among many), Federmeier, et al. (2001) demonstrated that using images to create the context of a positive mood state can dampen category effects, while Martín-Loeches, et al. (2012) found that altering the valence of a key adjective in a sentence has strong impacts on both semantic and syntactic processing. Clearly, emotional valence can affect many facets of language; but can emotional context feed back into the valence of a single word? If so, databases like

ANEW may only be the tip of the iceberg when exploring the emotional aspects of language. This study will be exploring the question of whether providing an emotional context can alter the perceived emotional valence of individual words. To answer this, we will be performing a partial replication of Bradley & Lang's study.

We have multiple hypotheses; first, placing a word in an emotional context will shift the perceived valence for that word (a positive context should cause the word to feel more positive, and a negative context should cause the word to feel more negative). Second, the amount (and even direction) that the target word shifts will not be correlated with the emotional valence of the context in isolation (i.e., simply adding together the emotional valence of the context and the target word will not predict the in-context valence). And finally, context will have a stronger effect on words with a stronger out-of-context valence is in either direction. To test the first, we can compare how subjects rate words out of context to how they rate those words when given emotional context, examining both individual variance (by word) and overall shift (averaging across words). To test the second, assuming the first hypothesis is correct, we can compare the strength of the shift in each word's valence to the emotional valence of the context that caused that shift. To test the third, we can compare in- and out-of-context mean valences by examining the slope of the regression line; assuming that a hypothetical "no change" result gives a slope of 1, if stronger out-of-context valence allows for a larger contextual effect, contrasting context (negative words in a positive context and positive words in a negative context) should result in a slope between 0 and 1, while matching context (negative words in a negative context and positive words in a positive context) should result in a slope greater than 1.

2. Experiment 1

2.1. Methods

Participants. This study was conducted using UCSD undergraduates (n = 133) age 18–35, restricted to native English speakers (defined as those who began learning English before the age of 7).

Materials. This study was administered online via Qualtrics. Stimuli included 90 target words (45 positive, 45 negative). Because word class is known to interact with emotional processing (Palazova et al., 2011), the target words were selected to be nouns. Target nouns were deliberately chosen so the mean for the positive and negative words was equidistant from neutral, with an identical mean arousal (shown by Bradley & Lang (1999) to interact with emotional valence). Each noun was given a positive and negative sentence; sentences were written to roughly control for both word and character count. 30 filler sentences and True/False questions were also included as attention checks.

Design. This experiment was a within-groups factorial design, with the two independent variables being the emotional valence of the target nouns and the emotional valence of the contexts. The types of experimental trials included in-context rating trials, out-of-context rating trials, context rating trials, and multiple kinds of attention checks. During the in-context rating trials, participants were shown the target noun placed at the end of a positive or negative sentence for 5 seconds (Fig. 1A), then progressed to the next screen, where they were given an additional 5 seconds to rate the target noun (Fig. 1B). Out-of-context rating trials included only the rating part of this (Fig. 1B), with participants being shown the next rating immediately after. During context rating trials, participants were shown the context sentence, but instead of rating the

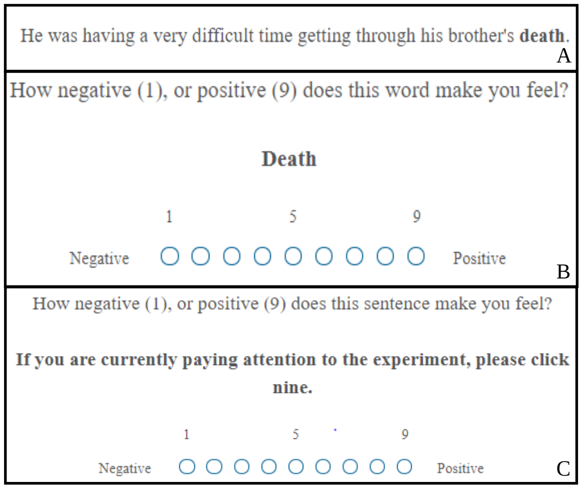

Fig. 1. Example sentence in-context rating trial (A/B) and context rating attention check (C).

target noun, participants were given 10 seconds to rate the sentence as a whole.

Attention check trials during the blocks containing in-context rating trials also displayed a negative or positive sentence with a negative or positive noun at the end; however, instead of having 5 seconds to rate a target noun, participants were given as long as necessary to answer a True/False question about the sentence.

Attention check trials during blocks containing out-of-context rating trials requested that participants let the 5 seconds pass without making a rating, showing the word **FREEZE** in all caps in place of a target noun.

Attention check trials during blocks containing context rating trials consisted of a sentence prompting that participants select a specific number on the 1–9 scale (Fig. 1C).

Procedure. Trials were split into 4 blocks: a training block (repeatable up to 5 times, after which a participant was considered to have "failed") that consisted of 5 in-context rating trials and 2 in-context attention check trials; two experimental blocks that each consisted of 30 in-context rating trials and 15 in-context attention check trials; and a final experimental block that consisted of 5 attention check trials and 30 experimental trials, which were either out-of-context rating trials or context rating trials, depending on the condition. Stimulus presentation within blocks was pseudo-randomized, being split into multiple versions that each ensured an even spread of both negative and positive nouns and negative and positive contexts. Subjects were split between conditions in which the final block consisted of out-of-context rating trials (n = 37) or sentence context rating trials (n = 96).

After giving informed consent and answering demographic questions about gender, race, current age, and the age they started learning English, participants were instructed on the nature of the SAM scale (see Appendix A). They then proceeded to the training block, and if successful (within a maximum of 5 attempts), were given a brief rest before starting the first trial block. Another rest was granted before starting the second trial block. Another rest was granted, and then new instructions were shown, after which they completed the final block.

2.2. Results

While our experiments did use the SAM 1–9 scale as Bradley & Lang (1999) did, we decided that the analysis would make more intuitive sense if the scale was re-centered with 0 as neutral instead of 5. To accomplish this, after the mean valences (MVs) were calculated for each word, we subtracted 5. For the sake of comparison, we did the same with the ANEW ratings for each word. Because of this, our scale ranges from -4–4.

Out-of-context. As expected, the out-of-context rating means (calculated from data gathered across both experiments) did not perfectly align with the ANEW means (Fig. 2); however, a t-test revealed that the

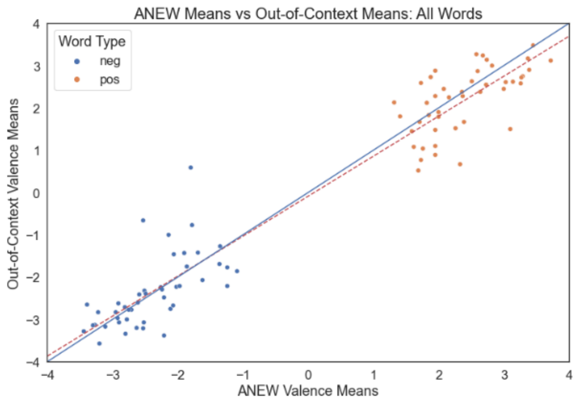

Fig. 2. This scatterplot shows the variance between the ANEW MVs (x-axis) and the out-of-context MVs (y-axis). The blue line is the line y = x (a hypothetical "no difference"), and the regression line is in red.

differences were negligible (t = 0.24, p = 0.81). After shifting the scale, across all target nouns the ANEW Grand Mean Valence (GMV; calculated by taking the mean of all the nouns' MVs) was 0; the out-of-context GMV was -0.09. We calculated the mean individual variance (a metric we refer to elsewhere in this paper as the mean negative/positive shift) between these two by subtracting the out-of-context MV from the ANEW MV for each word, taking the absolute value of each difference, and then taking the mean of the absolute values (mean individual variance and mean shift are thus positive regardless of the direction of the overall shift). The mean individual variance was 0.48. We did the same calculations after splitting the nouns into the positive and negative groups. For the negative nouns, the ANEW GMV was -2.38, the out-of-context GMV was -2.36, and the mean individual variance was 0.45. For the positive nouns, the ANEW GMV was 2.38, the out-of-context GMV was 2.18, and the mean individual variance was 0.52. Further t-tests continued to reveal negligible differences between the two (negative nouns: t = -0.14, p = 0.89; positive nouns: t = 1.32, p = 0.19).

Sentence contexts. Similar metrics were examined for the in-context ratings. Averaging across all nouns (Fig. 4A), when placed at the end of a negative sentence, the GMV was -0.76; the mean negative shift was 0.77; a t-test indicated moderate significance for this change (t = 2.04, p = 0.04). The GMV of the negative sentences was -2.48. When placed at the end of a positive sentence, the GMV was 0.20; the mean positive shift was 0.44; a t-test indicated no significance for this change (t = -0.81, p = 0.42). The GMV of the positive sentences was 1.93. However, using a 95% confidence interval for GMV suggested that while the noun-by-noun effect was statistically significant for negative contexts, the overall shift was not significant for either context.

All Nouns	**Sen.**	**Adj.**
ANEW GMV	0.00	
Out-of-Context GMV	-0.09	
In-Context (Neg) GMV	-0.76	-0.99
Context (Neg) GMV	-2.48	-2.00
Mean Shift (Neg)	0.77	0.97
In-Context (Pos) GMV	0.20	0.33
Context (Pos) GMV	1.93	1.52
Mean Shift (Pos)	0.44	0.61
Negative Nouns	**Sen.**	**Adj.**
ANEW GMV	-2.38	
Out-of-Context GMV	-2.36	
In-Context (Neg) GMV	-2.54	-2.57
Context (Neg) GMV	-2.74	-1.81
Mean Shift (Neg)	0.37	0.36
In-Context (Pos) GMV	-1.91	-1.63
Context (Pos) GMV	1.31	0.87
Mean Shift (Pos)	0.51	0.76
Positive Nouns	**Sen.**	**Adj.**
ANEW GMV	2.38	
Out-of-Context GMV	2.18	
In-Context (Neg) GMV	1.02	0.60
Context (Neg) GMV	-2.22	-2.19
Mean Shift (Neg)	1.17	1.58
In-Context (Pos) GMV	2.30	2.30
Context (Pos) GMV	2.56	2.16
Mean Shift (Pos)	0.37	0.46

Table 1. In- and out-of-context Grand Mean Valences (GMVs) and mean shifts. Sentence context values are on the left, and adjective context values are on the right.

We also examined these metrics with the nouns split into 2 groups. For negative nouns (Fig. 4B), the negative in-context GMV was -2.54 (mean negative shift of 0.37; t = 1.12, p = 0.27) and the positive in-context GMV was -1.91 (mean positive shift of 0.51; t = -2.47, p = 0.02 [moderate significance]). The GMV of the negative sentences was -2.74. The GMV of the positive sentences was 1.31. For positive nouns (Fig. 4C), the negative in-context GMV was 1.02 (mean negative shift of 1.17; t = 6.53, p < 0.01 [strong significance]) and the positive in-context GMV was 2.30 (mean positive shift of 0.37; t = -0.76, p = 0.45). The GMV of the negative sentences was -2.22. The GMV of the positive sentences was 2.56. Our 95% confidence interval supported these findings exactly; only our contrasting context conditions showed significance.

We ran a within-subjects ANOVA to determine the significance of noun type (negative or positive) and context type (negative or positive). We found that both were significant (noun type: F(1, 132) = 998.59, p < 0.01; context type: F(1, 132) = 114.66, p < 0.01), and that both effects were qualified by their interaction (F(1, 132) = 62.76, p < 0.01).

When an OLS regression was run with out-of-context MV as the independent variable and in-context MV as the dependent variable (Fig. 3 shows an example), we found that the slopes for each regression line was between 0 and 1; negative nouns in a negative context produced a slope of 0.66, negative nouns in a positive context produced a slope of 0.88, positive nouns in a negative context produced a slope of 0.67, and positive nouns in a positive context produced a slope of 0.64.

To explore the question of whether there was a link between the MV of the context and the shift in noun MV that the context caused, we ran an OLS regression with the sentence MVs as the independent variable and the

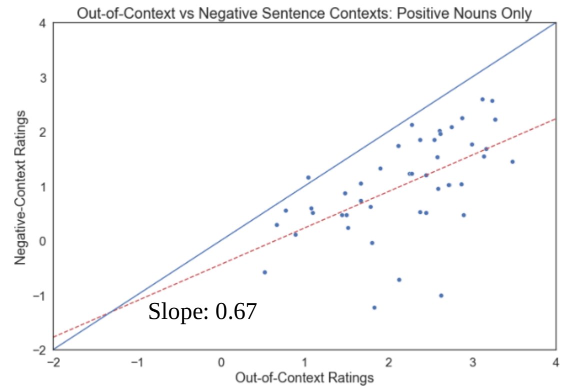

Fig. 3. This scatterplot shows the effects of negative sentences on positive nouns, comparing out-of-context MV (x-axis) and negative-context MV (y-axis). The solid blue line represents the line y = x (slope = 1) and the dashed red line represents the regression line (slope = 0.67).

mean negative/positive shift as the dependent variable. Across all words, negative sentence MVs failed to predict mean negative shift (R^2 = 0.003, p = 0.583) and positive sentence MVs failed to predict mean positive shift (R^2 < 0.001, p = 0.968). For negative words, the pattern mostly held: negative sentence MVs failed to predict mean negative shift (R^2 = 0.004, p = 0.665), though positive sentence MVs were slightly more likely to predict mean positive shift (R^2 = 0.118, p = 0.021). For positive words, the pattern was similar, but reversed: negative sentence MVs weakly predicted mean negative shift (R^2 = 0.236, p = 0.001) and positive sentence MVs failed to predict mean positive shift (R^2 = 0.009, p = 0.537).

2.3. Discussion

Although the overall shift was not shown to be significant when averaged across all nouns, contrasting context (negative nouns in positive sentences and positive nouns in negative sentences) caused a significant shift by every metric we used. In addition, both of our contrasting context conditions had a slope between 0 and 1, which supports our hypothesis that, when contextual effects are statistically significant, a stronger out-of-

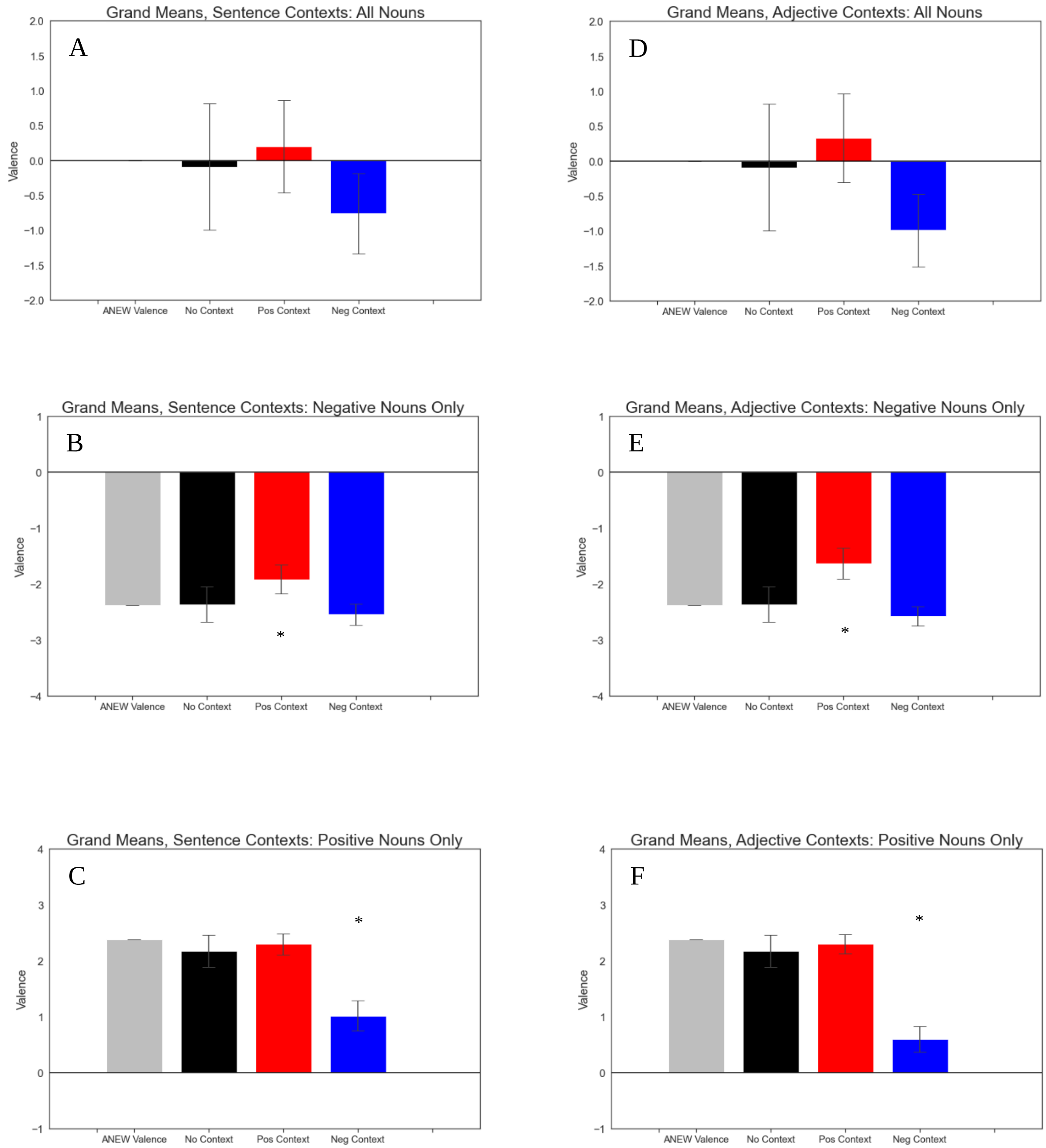

Fig. 4. Changes in the GMVs across conditions; the x-axis for each graph has the different conditions, specifically ANEW Valence (from Bradley & Lang, 1999), No Context (our out-of-context condition), Pos Context, and Neg Context (our two in-context conditions); the y-axis is our adjusted version of the SAM scale, with limits of -4 (negative valence) and 4 (positive valence), where 0 represents perfectly neutral valence. On the left (A–C), experiment 1 shows the effects of sentence contexts. On the right (D–F), experiment 2 shows the effects of adjective contexts. Across all 3 groups, adjectives consistently showed a stronger effect size. A/D show all 90 nouns together, B/E show just the negative nouns, and C/F show just the positive nouns. The error bars represent a 95% confidence interval.

context MV allows these contextual effects to be larger.

3. Experiment 2

Because of the limitations of experiment 1 (namely, that sentences are extremely variable as contexts, and thus difficult to draw conclusions from), we repeated the experiment with more controllable contexts: single adjectives.

3.1. Methods

Participants. Participants were taken from the same population as in experiment 1 (n = 129).

Materials. Target nouns remained the same as in experiment 1. In experiment 2, instead of sentences, each word was pared with a positive and negative adjective.

Design. The design was roughly equivalent to experiment 1. Out-of-context rating trials (and attention checks) remained the same. During in-context rating trials, participants were shown a negative or positive adjective followed by the associated negative or positive noun (Fig. 5A) for 2 seconds, then given 5 seconds to rate the target noun (Fig. 5B). Context rating trials were identical to the out-of-context rating trials, but participants rated adjectives instead of target nouns.

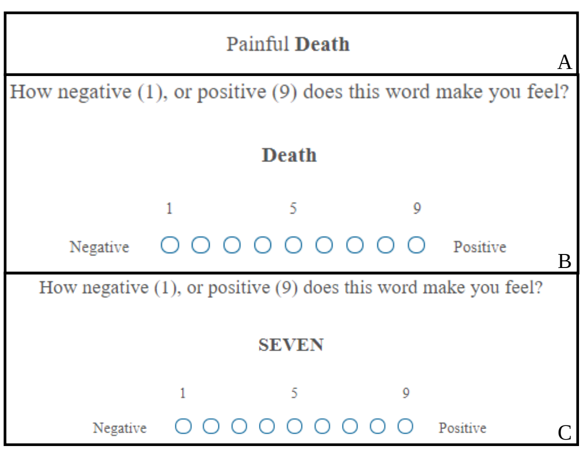

Fig. 5. Example adjective in-context rating trial (A/B) and in-context rating attention check (C).

Attention check trials during the blocks containing in-context rating trials also displayed a negative or positive adjective followed by a negative or positive noun; however, instead of having 5 seconds to rate a target noun, participants were told to select a specific number (Fig. 5C).

Attention check trials during blocks containing context rating trials were identical to the ones used with out-of-context rating trials.

Procedure. Experiment 2 was given identical structure to the first experiment. The training block consisted of 5 in-context rating trials and 2 in-context attention checks; the first two experimental blocks each consisted of 30 in-context rating trials and 15 in-context attention checks; and the final block consisted of 5 attention checks and either 30 out-of-context rating trials or 30 context rating trials. Participants were again split between conditions in which the final block consisted of out-of-context rating trials (n = 43) or context rating trials (n = 86).

3.2. Results

We applied an extremely similar analysis to this experiment as in experiment 1, including shifting the scale to be centered on 0. Please refer to section 2.2 for the out-of-context condition results. All GMV and mean shift results are also listed in Table 1 alongside the results from experiment 1.

Adjective contexts. Averaging across all nouns (Fig. 4D), when placed next to a negative adjective, the GMV was -0.99; the mean negative shift was 0.97; a t-test indicated strong significance for this change ($t = 2.86$, $p < 0.01$). The GMV of the negative adjective was -2.00. When placed next to a

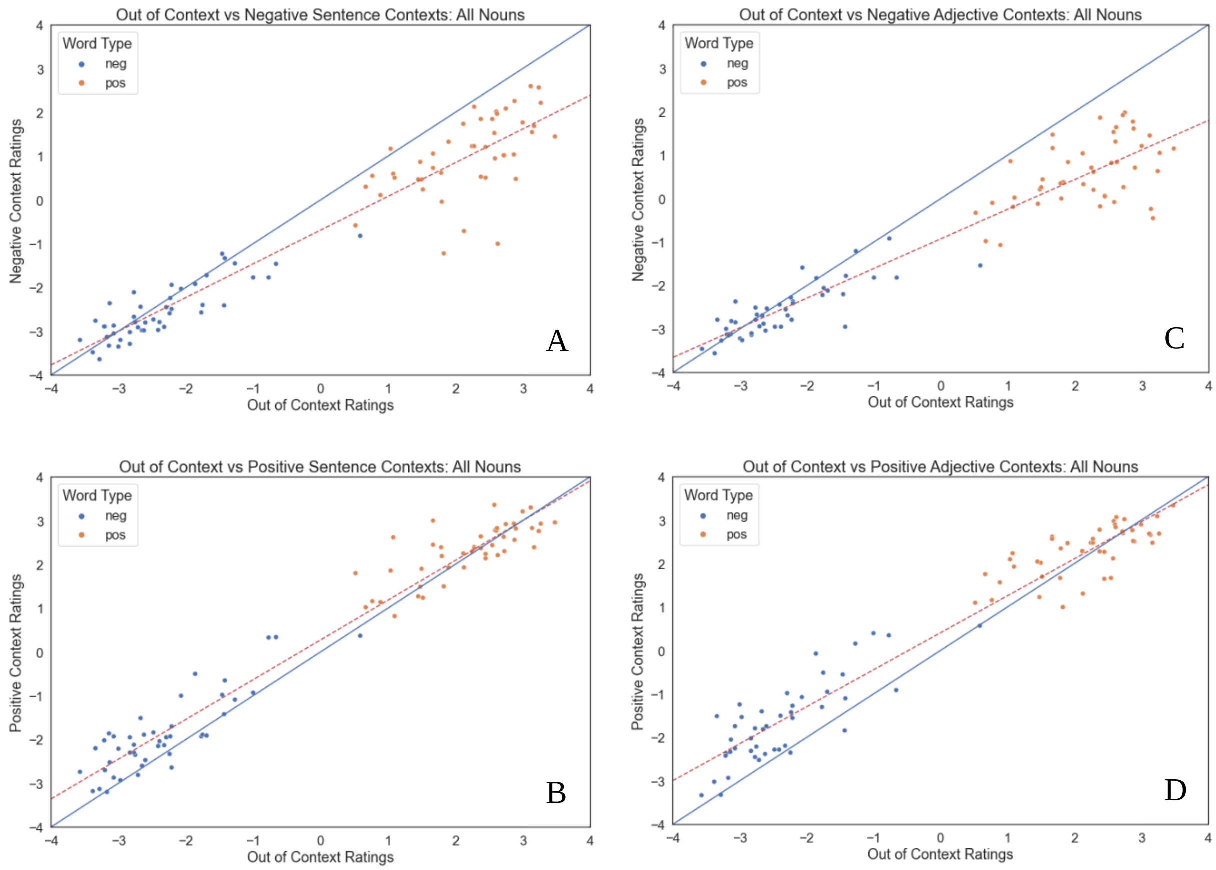

Fig. 6. Comparing MV out-of-context (x-axis) and in-context (y-axis) across individual nouns (negative in blue, positive in red); both axes show our adjusted SAM scale. The dashed red line represents the regression line for each condition, while the solid blue line is the line y = x (representing a hypothetical "no change" outcome); any point below this line shows a negative shift, and any point above shows a positive shift. A/B are from experiment 1 (sentence contexts), while C/D are from experiment 2 (adjective contexts); A/C show the effects of negative contexts, while B/D show the effects of positive contexts. As discussed in sections 2.3 and 3.3, negative nouns are shifted more by positive contexts, while positive nouns are shifted more by negative contexts.

positive adjective, the GMV was 0.33; the mean positive shift was 0.61; a t-test indicated no significance for this change ($t = -1.24$, $p = 0.22$). The GMV of the positive adjectives was 1.52. However, our 95% confidence interval for GMV suggested that while the noun-by-noun effect was statistically significant for negative contexts, the overall shift was not significant for either context.

Like before, we also examined these metrics with the nouns split into 2 groups. For negative nouns (Fig. 4E), the negative in-context GMV was -2.57 (mean negative shift of 0.36; $t = 1.39$, $p = 0.17$) and the positive in-context GMV was -1.63 (mean positive shift of 0.76; $t = -3.82$, $p < 0.01$ [strong significance]). The GMV of the negative adjectives was -1.81. The GMV of the positive sentences was 0.87. For positive nouns (Fig. 4F), the negative in-context GMV was 0.60 (mean negative shift of 1.58; $t = 9.74$, $p < 0.01$ [strong significance]) and the positive in-context GMV was 2.30 (mean positive shift of 0.46; $t = -0.78$, $p = 0.44$). The GMV of the negative adjectives was -2.19.

The GMV of the positive adjectives was 2.16. Our 95% confidence interval supports these findings exactly; only our contrasting context conditions showed significance.

We ran a within-subjects ANOVA to determine the significance of noun type (negative or positive) and context type (negative or positive). We found that both were significant (noun type: $F(1, 128) = 741.66$, $p < 0.01$; context type: $F(1, 128) = 141.76$, $p < 0.01$), and that both effects were qualified by their interaction ($F(1, 128) = 51.51$, $p < 0.01$).

When an OLS regression was run with out-of-context MV as the independent variable and in-context MV as the dependent variable, we found that the slopes for each regression line was between 0 and 1; negative nouns in a negative context produced a slope of 0.57, negative nouns in a positive context produced a slope of 0.91, positive nouns in a negative context produced a slope of 0.51 (Fig. 7), and positive nouns in a positive context produced a slope of 0.54.

We again ran an OLS regression with the adjective MVs as the independent variable and the mean negative/positive shift as the dependent variable to explore a possible connection. Across all nouns, negative adjective MVs failed to predict mean negative shift ($R^2 = 0.066$, $p = 0.014$) and positive adjective MVs failed to predict mean positive shift ($R^2 < 0.001$, $p = 0.939$). For negative nouns, the pattern held: negative adjective MVs failed to predict mean negative shift ($R^2 = 0.001$, $p = 0.853$), and positive adjective MVs failed to predict mean positive shift ($R^2 = 0.031$, $p = 0.249$). For positive nouns alone, there appears to be a weak predictive ability for both contexts: negative adjective MVs weakly predicted mean negative shift ($R^2 = 0.148$, $p = 0.009$) and positive adjective MVs weakly predicted mean positive shift ($R^2 = 0.179$, $p = 0.004$).

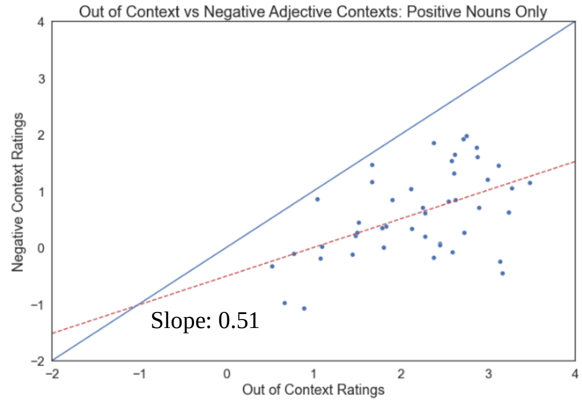

Fig. 7. This scatterplot shows the effects of negative sentences on positive nouns, comparing out-of-context MV (x-axis) and negative-context MV (y-axis). The solid blue line represents the line y = x (slope = 1) and the dashed red line represents the regression line (slope = 0.51).

3.3. Discussion

Our results from experiment 2 confirmed our findings from before, as the same conditions showed significance: negative nouns in positive contexts, and positive nouns in negative contexts. This continues to align with the idea that context matters more when it contrasts with a noun’s existing valence. In addition, the regression line slopes continue to support the idea that, when contextual effects are statistically significant, those effects are amplified when applied to nouns with stronger out-of-context MVs.

4. General Discussion

Whether the context was a full sentence or a single adjective, the effects of context were clear: context that contrasts with a noun’s out-of-context MV causes a much larger shift in MV than context that reinforces the noun’s out-of-context MV. In addition, the stronger the out-of-context MV is, the stronger effect context can have.

Because of the design, this study must be considered exploratory, as the exact nature of contextual effects was not investigated. We still do not quite understand the mechanisms behind how emotional context interacts with a noun’s out-of-context emotional valence. We hypothesize that perhaps the emotion is not associated with the word, but with the concept that word activates, and by providing a contrasting context, an entirely different concept is being activated. This is supported by the fact that matching context did not cause a significant shift; if the concept being activated does not change, then we can expect MV to remain relatively stable. However, further research would be required to confirm that idea. It is also worth noting that we have only explored this effect for nouns, and before we can extrapolate this effect to words of all classes, further research is required.

4.1. Future Directions

This study was limited to a self-report design by the nature of the temporal context; in the future, we believe it would be helpful to replicate the experiment with a more ERP-centric design. Studies like Federmeier et al. (2001), Martín-Loeches, et al., (2012), and Palazova, et al. (2011) have found that emotion can affect ERP components known to be associated with language processing (e.g., the P200, N400, and P600/late positivity), and we hypothesize that the proposed study would help uncover the neural mechanism behind the observed shift.

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Appendix A

Instructions as Presented to Participants

Starting Instructions; Sentences Context

This study will be exploring emotional words.
You will be asked to read a sentence, then rate how a specific word from that sentence makes you feel.
You will make this rating on a scale from 1–9.

Continue

At one extreme of this scale, you are happy, pleased, satisfied, contented, or hopeful. When you feel completely happy you should indicate this by clicking the bubble labeled "9".
The other end of the scale is when you feel completely unhappy, annoyed, unsatisfied, melancholic, despaired, or bored. You can indicate feeling completely unhappy by clicking the bubble labeled "1".
Numbers between 1 and 9 can also be selected to indicate intermediate feelings. If you feel completely neutral, neither happy nor sad, click the bubble labeled "5"
You will have 5 seconds to rate each word.

Continue

Sometimes, instead of rating a word from the sentence, you will be asked a True/False question about the sentence you just read. In these instances, you will click either "True" or "False".
You will have as long as you wish to answer these True/False questions.

You will now have a set of practice words and sentences to get used to the timing. Click "Continue" when you are ready to start.

Continue

Starting Instructions; Adjectives Context

This study will be exploring emotional words.
You will be asked to read a pair of words, then rate how the second word in that pair makes you feel.
You will make this rating on a scale from 1–9.

Continue

At one extreme of this scale, you are happy, pleased, satisfied, contented, or hopeful. When you feel completely happy you should indicate this by clicking the bubble labeled "9".
The other end of the scale is when you feel completely unhappy, annoyed, unsatisfied, melancholic, despaired, or bored. You can indicate feeling completely unhappy by clicking the bubble labeled "1".
Numbers between 1 and 9 can also be selected to indicate intermediate feelings. If you feel completely neutral, neither happy nor sad, click the bubble labeled "5"
You will have 5 seconds to rate each word.

Continue

Sometimes, instead of the second word of the pair, the word shown will be a number. In these instances, please click the bubble that corresponds to the number shown.
You will have 5 seconds to answer these number prompt questions.

You will now have a set of practice word pairs and number prompts to get used to the timing. Click "Continue" when you are ready to start.

Continue

Sentence Rating Instructions

In this final block, instead of rating the final word in a presented sentence, you will be rating how the sentence as a whole makes you feel. The rating scale remains the same as before.

Because of the extra length, you will have 10 seconds to make each rating.

Please click "Continue" when you are ready to begin.

Continue

Adjective/Out-of-Context Rating Instructions

In this final block, you will be presented with individual words to rate like in the previous block. In this block, however, the words will be presented alone (no sentence).

As before, you will have 5 seconds to rate each word.

In some cases, you will be shown the word "FREEZE" in all caps. In these cases, do not click anything; instead, wait for the 5 seconds to pass. The question will advance automatically, and the next word will be presented.

Please click "Continue" when you are ready to begin.

Continue