Explaining Anticipation's Affects on Experience: The Buffer Hypothesis

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Abstract

Recent theories propose that adolescents demonstrate increased sensitivity to reward (relative to children and adults), producing risk-taking. However, under controlled conditions of choice between sure and gamble options in both gain and loss frames, risk-taking declined with age. As reward increased, children took more risks, but adolescents and adults took fewer risks. Gender differences were observed only for children; males were more risk seeking. In addition, negative mood increased verbatim-based analysis for all groups.

Anticipation

-Optimism, the notion of positive anticipation about future events, helps buffer stress and contribute to positive coping (Hazlett, Molden, and Sackett, 2011); but what is the purpose of negative anticipation?

-Shepperd et al. (2008) defines the "Bracing hypothesis" as the overestimation of the likelihood of a negative outcome as a protection from the intense emotional reaction in case the outcome occurs. Since underestimating a negative event is more harmful than overestimating the likelihood of the event, people predict the worst news about their outcomes in order to avoid unpleasant surprises.

--Golub et al. (2009) argues in contrast with the "Bracing hypothesis" and proposes that even though negative expectations can "soften the blow" of a negative event occurring, bracing makes the person feel bad when waiting for the event to take place. Their study shows that although participants in the positive anticipation condition felt better before receiving the results of a test and participants in the negative anticipation condition felt worse before receiving the scores, both conditions felt equally bad after the actual event. The researchers concluded that bracing is a foolish strategy that only offers harm and no benefits.

--Although anticipation of an event might cause the event to be experienced differently when it occurs, a new hypothesis suggests that anticipation results in a different judgment of the *current* events that are experienced *before* the anticipated event.

The Buffer Hypothesis

--It is hypothesized that anticipating a positive event will "buffer" the experience of current negative events by making the events appear less negative.

-The mismatch between positive anticipation and negative experience is also hypothesized to affect encoding, due to the simultaneous activation of two areas of the brain: The pre-frontal cortex, responsible for planning and judgment, and the amygdala, responsible for emotion. The encoding malfunction is hypothesized to result in decreased accuracy during a recognition test, as well as increased reaction time during the test.

Hypotheses:

- The positive anticipation condition will judge the negative valenced images as less negative compared to the negative and neutral anticipation conditions.

-The valenced mismatched conditions (positive anticipation and negative valence, negative anticipation and positive valence) will have a higher reaction time during the recognition test than the non-mismatched conditions.

-The valenced mismatched conditions will have higher false alarm rates on the recognition test compared to the non-mismatched conditions.

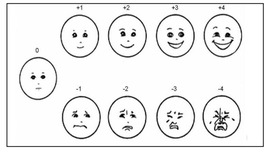
Participants

- 108 undergraduate students (27 Male, 81 Female) from Stephen F. Austin State University (M_{Age}= 19.32).

Procedure

-Participants were induced into an anticipated affect state by learning that they would view a video (positive, negative, or neutral) at the end of the study.
-8 valenced images (positive, negative, or neutral) were presented for 3 seconds on a computer screen and participants used a 9-point smiley face scale (see Figure 1) to judge how each image made them feel.
-After completing a number search filler task, participants took a recognition test by identifying whether each image on the test was "Old", previously shown during the presentation, or "New", not previously shown during the presentation".
-The recognition test contained 20 images (4 old same valence, 4 new same valence, 4 opposite valence, 4 neutral, and 4 shapes) that were all presented in a grayscale color format ,in order to avoid ceiling effects.
-After completing the recognition test, participants viewed the video that they were promised (positive, negative, or neutral), answered demographic questions, and were then debriefed.

Figure. 1



Positive Anticipation: *"We are going to show you a movie clip and ask you to rate the experience. Previous participants have said the movie clip made them* ***really*** *happy (Valence – 8.21; Arousal – 6.49). Some people claimed that it was the* ***funniest*** *video that they had ever seen!"*

Negative Anticipation: *"We are going to show you a movie clip and ask you to rate the experience. Previous participants have said the movie clip made them* ***really*** *distressed (Valence – 1.94; Arousal – 6.40). Some people claimed it was one of the* ***saddest*** *videos that they had seen!"*

Neutral Anticipation: *"We are going to show you a movie clip that has been shown to past participants and we will ask you to rate the experience."*

Results

Judgment

Results were analyzed using a univariate ANOVA which included anticipation (Positive, Negative, Neutral) and valence (Positive, Negative, Neutral) as the between-subjects factor and presentation judgment ratings as the within-subjects factor. Presented are main effects of anticipation collapsed across valence, and main effects of valence collapsed across anticipation. *Note: Reaction times for judgment ratings were analyzed but did not show a significant effect, indicating that participants did not process one set of valence images (e.g., positive images) differently than antother set of valence images (e.g., negative images).

Figure 1. Anticipation showed in a main effect on judgment ratings when collapsed across valence, $F(2,99) = 1.5$, $p = .04$, $\eta^2 = .063$. Images were rated as more positive in the neutral anticipation condition ($M = 0.21$, $SD = 1.09$) compared to the negative ($M = -0.17$, $SD = 1.55$) and positive ($M = -0.13$, $SD = 1.55$) anticipation conditions.

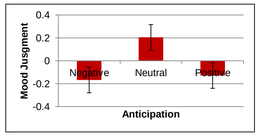


Figure 2. Valence showed in a main effect on judgment ratings when collapsed across anticipation, $F(2,99) = 79.58$, $p < .001$, $\eta^2 = .78$. Neutral images ($M = .021$, $SD = 0.43$) were rated significantly lower than positive images ($M = 1.43$, $SD = 0.55$) and were rated significantly higher than negative images ($M = -1.54$, $SD = 1.02$).

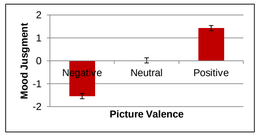
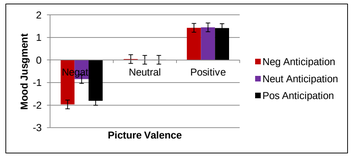


Figure 3. An interaction effect was observed between anticipation and valence, $F(4,99) = 1.48$, $p = .015$, $\eta^2 = .117$. Negative images were rated significantly less negative in the neutral anticipation condition ($M = -0.84$, $SD = 0.71$) compared to the negative ($M = -1.97$, $SD = 0.87$) and positive ($M = -1.81$, $SD = 1.11$) anticipation conditions.



Memory Accuracy

Results were analyzed using a univariate ANOVA which included anticipation (Positive, Negative, Neutral) and valence (Positive, Negative, Neutral) as the between-subjects factor and scores on the recognition test as the within-subjects factor. Presented are main effects and higher order interactions that qualified main effects.

Figure 4. Congruency of anticipation and valence showed a main effect on memory accuracy, $F(2,33) = 3.59$, $p = .039$. An anticipated affect was shown as participants had less accuracy on a recognition test when anticipating a positive or negative event.

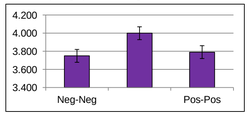


Figure 5. A significant main effect of reaction time occurred between item type, $F(1,99) = 3.77$, $p < .05$. Old items ($M = 1280.73$, $SD = 911.87$) were judged significantly faster than new items ($M = 1415.10$, $SD = 1360.27$).

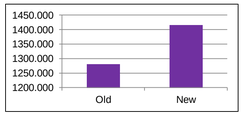
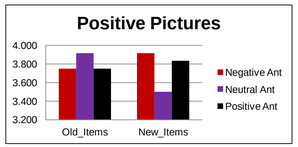


Figure 6. A marginal effect was shown in a three-way interaction between stimuli type, anticipation, and valence, $F(4,99) = 2.11$, $p = .086$. Positive new items were recognized less accurately when under neutral anticipation ($M = 3.50$, $SD = .90$) compared to positive ($M = 3.83$, $SD = 0.39$) and negative ($M = 3.92$, $SD = 0.23$) anticipation.



Discussion

Overall, our results do not support the reward sensitivity hypothesis. As seen in figures 3-5, adolescents did not favor the larger magnitude rewards as the second graders in our sample did. Instead, their pattern of choices more closely resembled adults, with an increase in favoring the surer option as the magnitude of rewards grew larger. This supports the fuzzy-trace idea that adolescents are in a transition stage from quantitative analysis in childhood to more gist-based qualitative decision making favored by adults.

In addition, negative mood enhanced quantitative processing, as illustrated in figures 6-11. The overall pattern shows that when framing patterns in negative mood are compared to framing patterns in neutral mood, standard framing patterns are ameliorated or in some cases even shift to a reverse framing pattern. This effect was smallest for adults, possibly due to greater experience in mood regulation.

This study examined decision making in a standard framing task across three age groups. Of importance, the same task was administered to children, adolescents, and adults, which allows comparisons of sensitivity to reward. The pattern of choices found for adolescents does not support the idea that adolescents are more sensitive to reward. Instead the pattern suggests that adolescents are in a transition period between verbatim-based analytic processing to gist-based intuitive processing.

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