

# When Bad Emotions Seem Better: Experience Changes the Automatic Evaluation of Anger

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## Abstract

Evaluations of objects change as a function of our experience with them. We suggest that this also applies to the evaluation of emotions. In three studies, we show that the evaluation of anger changes as a function of direct experience with anger. We found that the experience of anger in a context in which it could be beneficial (i.e., an aggressive computer game) led people to perceive anger as more useful (Study 1). Moreover, people came to evaluate anger less negatively after experiencing anger in a context in which it could be beneficial. These changes did not result from the mere experience of anger or from exposure to an aggressive context (Study 2). Rather, the more anger improved their performance, the less negatively participants came to evaluate anger (Study 3). These findings suggest that how bad anger seems may depend on our direct experience with it.

## Keywords

emotions, evaluation, anger, attitudes, goals, utility

Emotions are defined, in part, by how positive or negative they are (e.g., Ekman, 1999). Some emotions are negative (e.g., anger), whereas others are positive (e.g., happiness). The value of emotions is often reflected by their hedonic quality, such that unpleasant emotions are considered negative, and pleasant emotions are considered positive (e.g., Frijda, 1986). The hedonic quality of emotions, however, is not the sole contributor to their value. Several theorists have proposed that the value of emotions may vary, depending on the context (e.g., Russell, 2009; Solomon & Stone, 2002). In this investigation, we propose that similar to the manner in which people learn the value of other things in the world, people may also learn the value of emotions. Specifically, we tested whether people might evaluate anger less negatively if they experience it as potentially beneficial.

## Evaluating Emotions

Evaluations change with the introduction of new information about the target object (e.g., Anderson, 1971; Fazio, 2007). Associations with desirable outcomes contribute to more positive evaluations, whereas associations with undesirable outcomes contribute to more negative evaluations (Fazio & Olson, 2003). Over time, new information about the object in reference to goal attainment becomes integrated with preexisting evaluations (Cunningham & Zelazo, 2007; Eagly & Chaiken, 2007). Such learning shapes the evaluation of any target, from peanuts (see Fazio, Powell, & Williams, 1989) to racial groups.

Although mere associations of objects with goal attainment may influence their evaluation (e.g., Ferguson, 2007), value is learned most effectively through direct experience with the target (e.g., Fazio & Zanna, 1978). Compared to no experience or to indirect experience, direct experience with a target results in stronger evaluations (e.g., Fazio, Chen, McDonel, & Sherman, 1982) and leads to more dramatic changes in evaluations (e.g., Duerden & Witt, 2010; Murphy-Russell, Die, & Walker, 1986). The direction of change, in turn, depends on whether the target is experienced in relation to desirable or undesirable outcomes (Regan & Fazio, 1977). For instance, peanuts will be evaluated more positively if consuming them leads to pleasant satiation, but more negatively if consuming them leads to an allergic reaction.

We propose that the same process applies to the evaluation of emotions. Although emotions are themselves evaluative states, they can also serve as the target of evaluation and vary in how positively or negatively they are evaluated (Solomon & Stone, 2002). To the extent that the evaluative processing of emotions is similar to that of other attitude objects, it should

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shift as a function of direct experience. If an emotion is experienced in relation to a cost, it should be evaluated more negatively than before. If an emotion is experienced in relation to a benefit, it should be evaluated more positively. Such positive change in the evaluation of emotion should happen independently of whether it is pleasant or unpleasant to experience and whether it has been evaluated positively or negatively in the past.

Although little research to date has examined whether and how changes occur in the evaluation of emotion, research on emotional preferences (i.e., what emotions people want to experience) is consistent with the possibility that emotions are evaluated more positively when they are useful. Such research has shown that people are more motivated to experience emotions that are potentially beneficial for goal attainment. For instance, when people expect to perform a task in which anger may be beneficial, they choose activities that increase their level of anger (e.g., Tamir, Mitchell, & Gross, 2008). Such preferences for anger are mediated by the expectation that anger would be beneficial (Tamir & Ford, 2012). However, whether perceived utility is linked to the evaluation of anger (rather than to the willingness to experience it) remained to be tested. More importantly, the current investigation is the first to test the possibility that direct experience of utility can modify the evaluation of emotions.

By integrating research on evaluation and emotion regulation, we propose that experiencing an emotion in a context in which it can promote goal attainment would lead to a more positive evaluation of that emotion. To provide a strong test of this hypothesis, we tested whether people can come to evaluate a negative emotion less negatively, as a result of their direct experience with it. Specifically, we tested whether experiencing anger in a context in which it can be beneficial would lead people to evaluate anger as less negative.

## Measuring the Evaluation of Anger

To date, researchers have focused primarily on assessing the deliberate evaluation of emotions, using direct, self-report measures of attitudes (e.g., Harmon-Jones, Harmon-Jones, Amodio, & Gable, 2011). Such measures, however, may be biased by social desirability and subject to demand characteristics (Olson & Fazio, 2001). In the case of negative emotions, people might be reluctant to report positive evaluations, due to impression management, for instance. Indeed, in some cultures it is inappropriate to express positive evaluations of certain negative emotions (Eid & Diener, 2001).

To minimize such biases, the present research used an indirect measure of evaluation. Specifically, we created a version of the Implicit Association Test (IAT) that measured the strength of the associations between anger and evaluative attributes (e.g., good vs. bad). Using an indirect measure enabled us to minimize the potential effects of demand characteristics (Fazio, 2007; Gawronski & Bodenhausen, 2011). Furthermore, because reactions to the IAT are difficult to control, using this measure allowed us to assess changes in the evaluation of

anger, while minimizing effects that may arise from participants' motivation to show consistency in their responses.

## The Current Investigation

Because anger can promote aggression (e.g., Frijda, 1986), it could be instrumental in tasks that require aggressive behavior. Prior research has shown, for example, that anger can be beneficial for performance in aggressive computer games (Tamir et al., 2008). As a consequence, people who experience anger when playing such games may come to evaluate anger less negatively. To examine this hypothesis, in Study 1, we measured the perceived utility of anger after experiencing it (vs. not) when playing an aggressive game. To do so, we experimentally induced anger by having participants listen to anger-inducing music while playing a game. We expected people who experience anger while playing an aggressive game to subsequently view anger as more useful than those who did not experience anger.

Next, we conducted two studies to test whether the experience of anger while playing aggressive computer games changes the evaluation of anger, more generally. We experimentally induced anger in participants as they were playing a computer game. We assessed changes in evaluation by measuring the automatic evaluation of anger before and after the game. In Study 2, participants played either an aggressive or a nonaggressive computer game while listening to emotion-inducing music. We expected the automatic evaluation of anger to improve only among participants who listened to anger-inducing music while playing an aggressive game. In Study 3, we tested whether changes in the evaluation of anger were directly related to the actual utility of anger in the game. We expected participants to evaluate anger less negatively, the more beneficial anger was for their performance.

## Study 1

People are generally aware of the fact that anger is useful for confrontation (e.g., Tamir & Ford, 2012). However, our investigation is based on the assumption that perceived utility can change as a function of direct experience. To test this assumption, we examined whether people who experience anger (vs. those who do not) in a context in which it is useful subsequently judge anger as more useful. In Study 1, therefore, participants were randomly assigned to an emotion induction condition (i.e., anger vs. neutral). Following the emotion induction, participants played an aggressive computer game, in which they were instructed to kill as many enemies as possible. To confirm that effects were specific to anger, we also measured the perceived utility of fear. Similar to anger, fear is also negative and high in arousal, but unlike anger, it promotes active avoidance and so may be less useful for performance in the game. Even though the objective utility of anger for performance in aggressive games should be constant, we predicted that the subjective utility of anger would increase following direct experience with it. Therefore, we expected participants who directly experienced

anger (but not fear) while playing an aggressive game to subsequently perceive anger (but not fear) as more useful.

## Method

### Participants

Sixty-three (19.35% female) undergraduates ( $M_{\text{age}} = 24.11$ ) at an Israeli university completed the study for course credits or US\$12.<sup>1</sup>

### Procedure

Participants were introduced to a first person shooter game and practiced playing the game for 5 min. Participants were then randomly assigned to play the game for another 5 min while listening to either anger-inducing or neutral music. Finally, participants rated the utility of anger and fear and the extent to which they felt these emotions while listening to the music.

### Materials

**Computer game.** Participants played a first person shooter game, in which their goal was to find and kill as many enemies as possible (see Tamir et al., 2008).

**Emotion-inducing music.** Participants listened to either anger-inducing (“Refuse/Resist” by Apocalyptica) or to neutral (“Treefingers” by Radiohead) instrumental music clips. Prior studies confirmed the expected emotional impact of these clips (e.g., Tamir et al., 2008).

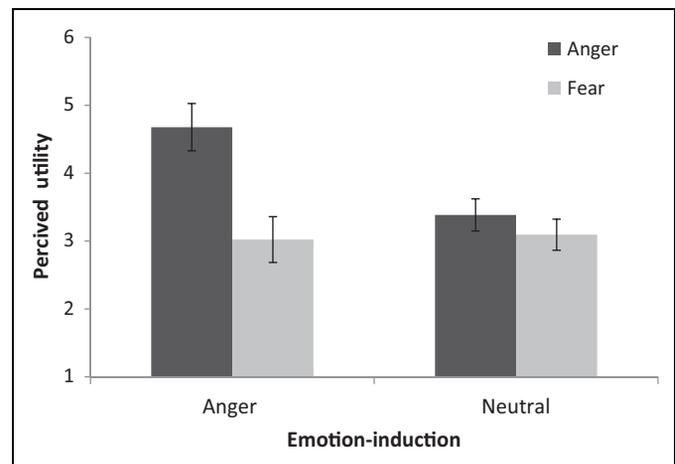
**Perceived emotion utility.** Participants rated the degree to which they believed certain emotions were useful for game performance (1 = *not at all* and 7 = *very much*). To assess the utility of anger, we averaged across ratings of *angry*, *irritated*, and *furious* ( $\alpha = .95$ ). To assess the utility of fear, we averaged across ratings of *fearful*, *worried*, and *concerned* ( $\alpha = .74$ ).

**Emotional reactions.** Participants rated the degree to which they experienced anger, fear, and pleasure, while listening to the music clips (1 = *not at all* and 7 = *very much*). We assessed anger by averaging across ratings of *angry* and *irritated* ( $\alpha = .88$ ), and fear by averaging across ratings of *fearful* and *worried* ( $\alpha = .86$ ).

## Results and Discussion

### Manipulation Check

A repeated-measures analysis of variance (ANOVA), predicting emotional experiences from condition (anger vs. neutral) as a between-subject factor and emotion (anger vs. fear) as a within-subject factor, confirmed that the anger induction was successful. As expected, we found a significant Condition  $\times$  Emotion interaction,  $F(1, 60) = 6.38, p = .014, \eta_p^2 = .096$ , such that participants who listened to anger-inducing music experienced more anger,  $F(1, 60) = 32.44, p < .001, \eta_p^2 = .35$ , than



**Figure 1.** The perceived utility of anger and fear in the computer game, as a function of condition (anger vs. neutral; Study 1).

participants in the neutral condition, and they experienced significantly more anger than fear,  $d = .92, SE = .22, p < .001$  ( $M = 3.32$  and  $2.40$ , respectively).<sup>2</sup> Participants in the two conditions did not differ in the degree of pleasure they experienced while listening to music,  $t(60) < 1.04$ .

**Emotion utility.** To test whether participants perceived anger (but not fear) as more useful after experiencing it while playing the game, we conducted a repeated-measures ANOVA predicting the perceived utility of emotions from condition (anger vs. neutral) as a between-subject factor and emotion (anger vs. fear) as a within-subject factor. We found a main effect for emotion,  $F(1, 60) = 23.34, p < .001, \eta_p^2 = .28$ , such that across conditions, participants perceived anger as more useful for game performance than fear ( $M = 4.03$  and  $3.06$ , respectively). However, as we expected, this effect was qualified by a significant Condition  $\times$  Emotion interaction,  $F(1, 60) = 11.45, p = .001, \eta_p^2 = .16$  as shown in Figure 1, participants who played an aggressive game while experiencing anger (vs. a neutral state) consequently perceived anger as more useful for performance in the game,  $F(1, 60) = 7.11, p = .010, \eta_p^2 = .11$ . Conditions did not differ in the perceived utility of fear,  $F < 1$ . These findings demonstrate that experiencing anger in a context in which it might be useful leads people to perceive it as more useful in this context. In the next studies, we proceeded to test whether the experience of anger in a context in which it is useful also changes people’s evaluation of anger.

### Study 2

Study 2 included four experimental conditions (see Table 1). To test whether the evaluation of anger became less negative when people experience anger while engaged in a task that could benefit from anger, participants in the experimental condition played an aggressive game while listening to anger-inducing music and their evaluation of anger was assessed before and after the game. To test whether potential changes resulted simply from listening to angry music, participants in

**Table 1.** Emotion IAT Scores Before and After Playing a Computer Game While Listening to Music in Each Experimental Condition (Study 2).

Condition	Evaluated Emotion	Induced Emotion	Computer Game	Experienced Anger, <i>M</i> ( <i>SD</i> )	Pregame IAT	Postgame IAT	Paired <i>t</i> -Test	Cohen's <i>d</i>
Experimental	Anger	Anger	Aggressive	3.50 (2.40)	-.59	-.37	$t(25) = 3.31^*$	.513
Other game	Anger	Anger	Nonaggressive	3.06 (1.88)	-.53	-.47	$t(25) = 0.81$	.189
Other emotion	Anger	Neutral	Aggressive	2.05 (1.65)	-.59	-.54	$t(27) = 0.79$	.181
Other measure	Joy	Anger	Aggressive	3.21 (2.48)	.47	.42	$t(23) = -0.53$	-.148

\* $p < .005$ .

the *other game* control condition underwent the same procedure but played a carefully matched nonaggressive game. To test whether potential changes in the evaluation of anger resulted simply from playing an aggressive game, participants in the *other music* control condition played the aggressive game but listened to neutral rather than anger-inducing music. Finally, to test whether potential changes were specific to the evaluation of anger per se, participants in the *other measure* control condition underwent the same procedure as those in the experimental condition, but we assessed their evaluation of joy rather than anger. We expected the evaluation of emotion to improve only in the experimental condition.

## Method

### Participants

Participants were 107 male undergraduates ( $M_{\text{age}} = 25.20$ ) at an Israeli university, who participated for course credit or \$7.<sup>3</sup>

### Materials

**Implicit association tests.** Participants completed an anger or joy IAT, following the block design recommended by Greenwald, Nosek, and Banaji (2003), shown in Table 2. Key categories included bad versus good and anger (or joy) versus furniture, which served as a neutral, baseline category (e.g., Cheung, Noel, & Hardin, 2011). Each category included five Hebrew words (e.g., *trash*, *health*, *anger*, *joy*, and *table*, for the bad, good, anger, joy, and furniture categories, respectively), which showed strong associations with the relevant category in a pretest.

**Computer games.** Participants played one of two versions of a first person shooter game. In the aggressive version, participants' goal was to find and kill enemies. In the nonaggressive version, participants' goal was to find and collect gifts. The aggressive and nonaggressive versions were identical, except that in the nonaggressive version gifts appeared instead of enemies, and the players had to collect (instead of shoot) the gifts. Players in the nonaggressive game did not hold weapons and no shooting took place.

**Emotion inductions.** Participants listened to either the anger inducing or the neutral music clips that were used in Study 1.

**Emotional reactions.** Participants rated the extent to which they felt various emotions while listening to the music (1 = *not at*

**Table 2.** Sequence of Blocks in the IAT Measuring Anger Evaluations.

Block	No. of Trials	Items Assigned to Left-Key	Items Assigned to Right-Key
B1	20	Furniture	Anger
B2	20	Bad	Good
B3	20	Furniture/bad	Anger/good
B4	40	Furniture/bad	Anger/good
B5	40	Anger	Furniture
B6	20	Anger/bad	Furniture/good
B7	40	Anger/bad	Furniture/good

Note. Blocks B3, B4, B6, and B7 alternated trials presenting a positive or negative word with trials presenting an anger or furniture word. Items and labels related to anger versus furniture were presented in a different color than those related to positive versus negative. In Study 2, trials in which an error was made required the participant to correct the error before proceeding. In addition, in Study 2, the joy Implicit Association Test (IAT) followed the same design, with joy replacing anger. In Study 3, we used a shorter version of the IAT which excluded blocks B3 and B6. Also, participants did not receive an error message upon incorrect categorizations. Following the recommendation of Greenwald, Nosek and Banaji (2003), we added a penalty score to reaction times on error trials. Finally, in Study 3, the sorting rules in Blocks B1 and B4 were counterbalanced between participants with B5 and B7.

*all* and 9 = *very much*). To estimate the experience of anger, we averaged across ratings of *angry* and *irritated* ( $\alpha = .84$ ). To estimate the experience of joy, we averaged across ratings of *joyful* and *happy* ( $\alpha = .85$ ). We also assessed participants' pleasure while listening to the clips. Target items were interspersed among several filler items.<sup>4</sup>

### Procedure

Participants were told the study examined whether cognitive speed predicted performance under cognitive load. All participants completed an IAT, played a computer game for 5 min while listening to neutral music as practice, played another 5 min of the game while listening to the target music (different from the music during practice), and then completed the IAT again. Afterward, participants listened to 40-second excerpts of the music clips they heard earlier and rated how they felt while listening to the music. Finally, participants underwent a funnel debriefing procedure and were probed for suspicion. None of the participants were aware of our hypotheses.

## Results and Discussion

As predicted and shown in Table 1, paired sample *t*-tests confirmed that only participants in the experimental group—

namely, those who played the aggressive game while listening to anger-inducing music showed a reliable change in the evaluation of anger,  $t(25) = 3.31, p = .003$ , Cohen's  $d = .513$ . To test whether changes in evaluation in the experimental condition differed from changes in the other conditions, we ran a one-way ANOVA, using the difference between IAT scores before and after the manipulation as the dependent variable and condition as the independent variable. A planned contrast in ANOVA found that the change in IAT scores in the experimental condition was larger than in the other groups,  $t(100) = 2.35, p = .021$ .

Planned contrasts showed that all participants who listened to angry music felt equally angry,  $t(100)s < 1$  and reported more anger than participants who listened to neutral music,  $t(100) = 2.57, p = .012$  (see Table 1 for means and *SD* of anger experience). Conditions did not differ in levels of joy,  $t(101)s < 1.35$ . As in Study 1, the experimental condition did not differ from the other conditions in the degree of pleasure participants experienced,  $t(100) < 1$ .

These results suggest that the experience of anger (but not neutral feelings) while playing an aggressive game (but not a nonaggressive game) leads to less negative evaluations of anger (but not joy). These results cannot be attributed to playing an aggressive computer game, because participants who played an aggressive game without listening to angry music did not change their evaluations of anger. Also, these results could not be attributed to the experience of anger, because participants who listened to angry music while playing a nonaggressive game did not change their evaluations of anger. Instead these findings suggest that changes in the evaluation of anger (but not joy) may be due to the direct experience of anger in a context in which it could be useful.

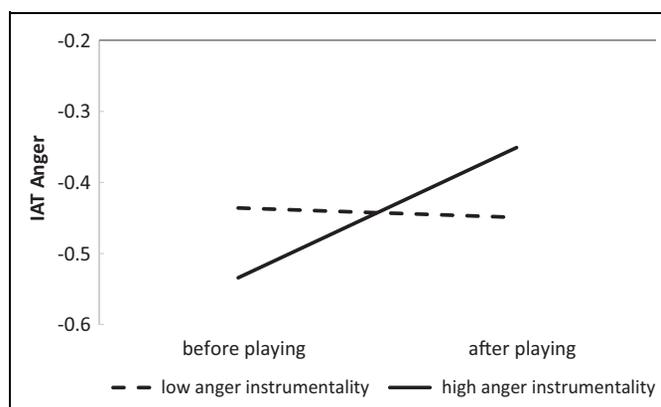
### Study 3

The findings of Study 2 demonstrate that the experience of anger when playing a game in which anger might be beneficial led people to evaluate anger less negatively. We assume that such changes in the evaluation of anger may have resulted from the direct experience of the utility of anger. In Study 3, therefore, we tested this possibility directly. After playing a practice round, each participant played two rounds of the aggressive computer game: one while listening to neutral music and another while listening to anger-inducing music, in a counter-balanced order. In each round, we measured how many enemies the participant killed. The objective utility of anger was assessed by comparing performance while listening to neutral music to performance while listening to angry music. We expected that the more participants benefited from the experience of anger while playing the game, the less negatively they would come to evaluate anger.

## Method

### Participants

Forty-three male students ( $M_{\text{age}} = 25.20$ ) from an Israeli university participated for course credit or US\$5.<sup>5</sup>



**Figure 2.** Anger Implicit Association Test (IAT) scores before and after playing an aggressive game, as a function of how much anger benefited performance (low anger instrumentality =  $-1$  *SD* from the mean; high-anger instrumentality =  $+1$  *SD* from the mean; Study 3).

### Materials

The anger IAT was a shorter version of that used in Study 2 (see Table 2). The computer game and music clips were the same as in Study 2.

### Procedure

Participants completed the anger IAT and then played three rounds of the aggressive game, 5 min each. All participants listened to neutral music while playing a practice round. Participants then played two more rounds, listening either to anger-inducing music or to different neutral music, with the order counter-balanced across participants. Unlike Study 2, in this study, we recorded the number of enemies the participant killed in each round. Finally, participants completed the anger IAT again.

## Results and Discussion

To assess the objective utility of anger, we computed residual performance scores when listening to angry music, controlling for performance when listening to neutral music. To test whether the utility of anger influenced the subsequent evaluation of anger, we submitted the IAT scores to a repeated-measured analysis of covariance, with time (before and after the game) as a within-subject factor, order (listening to angry music in the first or second round) as a between-subject factor, and anger utility as a covariate.<sup>6</sup> Replicating the findings in Study 2, we found a main effect for Time,  $F(1, 36) = 4.35, p = .044, \eta_p^2 = .11$ , such that on average, the automatic evaluations of anger became less negative upon playing the game ( $M = -.50$  and  $-.40$ , before and after the game, respectively). More importantly, as shown in Figure 2, this effect was qualified by a significant Time  $\times$  Anger Utility interaction,  $F(1, 36) = 5.22, p = .028, \eta_p^2 = .13$ , such that the more participants benefited from anger, the less negative their evaluation of anger became upon playing the game. No other effects were significant,  $F < 2.73$ .<sup>7</sup> These findings demonstrate that the evaluation of anger becomes less negative the more anger benefits goal pursuit.

## General Discussion

Our findings demonstrate that the evaluation of emotions might depend on people's direct experience with them. Participants who experienced anger in a context in which it was potentially beneficial (Studies 1 and 2) or objectively beneficial (Study 3) came to evaluate anger less negatively, as a consequence. This change in the evaluation of anger could not be attributed to the mere experience of anger or to the task that was performed while participants experienced anger. Instead, anger was evaluated less negatively after it was experienced in a context in which it was beneficial. Because we assessed the evaluation of anger using an indirect measure, it is unlikely that our findings reflect effects of experimental or social demands.

## Theoretical and Applied Implications

Previous research has shown that emotions become more desirable when they are expected to be instrumental for goal pursuit (e.g., Tamir, Bigman, Rhodes, Salerno, & Schreier, 2015; Tamir & Ford, 2012). However, whether the evaluations of emotions change as a function of experienced utility has not yet been examined. People may evaluate anger just as negatively in different contexts but vary in their willingness to experience it. Alternatively, however, people may come to evaluate anger less (or more) negatively, depending on their direct experience with anger. Building on research on the instrumental approach to emotion regulation (e.g., Tamir, 2009) and research on attitudes formation (e.g., Fazio & Olson, 2003), the current investigation tested whether evaluations of emotions change as a function of experience.

Our findings show that people are able to learn about the utility of an emotion from their direct experience with it and that such learning changes how they evaluate that emotion, more generally. In particular, our findings provide evidence for a dynamic process of change in the evaluation of anger that can be linked to utility. In doing so, our findings suggest that at least one reason why some people evaluate anger less negatively than others is that they have previously benefited from it. This mechanism of attitude change could help explain individual differences in anger evaluations (e.g., Harmon-Jones, 2004; Harmon-Jones et al., 2011; Ford & Tamir, 2014). People who often experience anger in contexts in which it is potentially harmful are likely to cultivate more negative evaluations of anger. However, people who often experience anger in contexts in which it is potentially beneficial (e.g., bill collectors; Sutton, 1991) may cultivate less negative evaluations of anger, as a consequence.

Given that evaluations can shape behavior, our findings may carry implications for understanding emotion-related behaviors. People who experienced anger as a facilitator of goals might develop less negative evaluations of anger. In turn, less negative evaluations of anger may increase people's willingness to experience anger. There is already some evidence that evaluations of emotions are associated with different emotional preferences that may result in different emotional experiences

(Harmon-Jones et al., 2011). In the present research, we measured automatic evaluations and found that they change as a function of experience with the target emotion. Future research could examine the potential influence of experience-based changes in the evaluations of emotions on emotional behavior and emotion regulation.

## Limitations and Future Directions

We hope that our findings would inspire further research to investigate the scope and malleability of changes in the evaluations of emotions. Although across studies participants evaluated anger negatively, we were able to show that a single brief experience of anger as potentially useful was sufficient to shift the evaluation of anger so that it became less negative. These findings are consistent with the idea that, like other attitude objects (e.g., Ferguson, 2007), emotions may be evaluated, in part, based on their instrumental value. Whether experiences can shift the evaluation of emotions so that negative emotions become positive, or whether experience can only change evaluations within the constraints of valence (e.g., anger is always evaluated negatively but just how negatively may depend on the context) remains to be tested.

In addition, our studies focused exclusively on anger and used a single measure to assess automatic evaluations (i.e., the IAT). Given the limitations of the IAT (Fiedler, Messner, & Bluemke, 2006; Olson & Fazio, 2004), future research should use both direct and indirect measures to assess change in the evaluations of anger. Future research could also examine people's awareness to such a change in their own evaluations. Future studies should also use measures to assess emotional experiences, during (and not just after) task performance as well as compare the experience of anger to the experience of other emotions such as fear, to test whether our findings are specific to the direct experience of anger or driven by its valence or arousal. Finally, future studies should also extend the present investigation to other emotions and other contexts.

## Conclusions

Some people evaluate targets, including peanuts or racial groups, less negatively than others, and such evaluations change as a function of experience. The present research shows that the same may be true for emotions. Some people evaluate anger less negatively than others and such evaluations could change as a function of direct experience. We found that one instance of potentially beneficial anger led people to evaluate anger less negatively. Just how bad anger seems to be, therefore, may depend on people's direct experience with it.

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## Declaration of Conflicting Interests

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## Notes

1. One participant was not included in the analysis because of missing relevant data.
2. This interaction qualified a main effect for condition,  $F(1, 60) = 35.07, p < .001, \eta_p^2 = .37$ , such that participants in the anger condition felt more intense emotions, on average, than those in the neutral condition ( $M = 2.86$  and  $1.27$ , respectively). It also qualified a main effect for emotional reaction,  $F(1, 60) = 12.69, p = .001, \eta_p^2 = .175$ , such that overall participants felt more anger than fear ( $M = 2.33$  and  $1.79$ , respectively).
3. Data on the IAT was not saved for two participants due to computer errors. In addition, one participant was sick during the study and was omitted from the analyses.
4. These items were confused, calm, surprised, sad, interested, embarrassed, and fearful.
5. Data on game performance were lost for two participants. Another participant was omitted due to a vision impairment that limited his ability to play the game.
6. We obtained the same effects when running a simple regression, in which we predicted the difference between the first and second IAT scores from anger utility, order, and their interaction as simultaneous predictors.
7. Using difference scores also yielded a Time  $\times$  Anger Utility interaction,  $F(1, 36) = 5.37, p = .026, \eta_p^2 = .13$ .

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