



Brief article

Divergent effects of different positive emotions on moral judgment

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ABSTRACT

Positive emotions are often treated as relatively similar in their cognitive-behavioral effects, and as having unambiguously beneficial consequences. For example, [Valdesolo and DeSteno \(2006\)](#) reported that a humorous video made people more prone to choose a utilitarian solution to a moral dilemma. They attributed this finding to increased positive affect. To determine whether such results actually stem in general from positive affect or from other more specific properties of humor, we conducted an experiment with moral dilemmas presented during an interleaved emotion-induction procedure involving mirth and another positive emotion, elevation. Mirth increased permissiveness for deontological violations, whereas elevation had the opposite effect. Furthermore, affective valence had no apparent independent influence on these judgments. Our results suggest that mirth and elevation have distinct cognitive consequences whose properties reflect their respective social functions, not their shared positive valence.

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1. Introduction

Although recent research has advanced our understanding of positive emotions, they are still less well understood than negative emotions. One striking difference in this understanding is the extent to which current accounts hypothesize a set of positive emotions with distinct social functions, neural bases, and physiological correlates. Whereas a rich body of theory distinguishes various negative emotions along all of these dimensions, in most accounts of positive emotion, valence still plays the principal role.

A prominent example of such an account is the broaden-and-build theory ([Fredrickson, 2004](#)), which posits that positive emotions serve to expand thought-behavior repertoires, whereas negative emotions narrow this scope. However, this theory does not distinguish among the effects of different positive emotions, and previous empirical tests have focused on how different positive emotional states lead to comparable behaviors ([Fredrickson & Branigan, 2005](#)). Such views have encouraged experimenters to use

a diverse set of stimuli for inducing positive affect, in effect treating diverse positive emotional states as equivalent ([Hamann, Ely, Hoffman, & Kilts, 2002](#); [Isen, Johnson, Mertz, & Robinson, 1985](#)).

The valence-based approach to positive emotion has permeated many areas of research, including moral psychology. In a study that has gained widespread attention, [Valdesolo and DeSteno \(2006\)](#) used a single humorous video to induce positive mood before having participants resolve a moral dilemma, the *footbridge problem* ([Thomson, 1976](#)), which concerns whether it is acceptable to push a stranger off a bridge in order to prevent a trolley from killing several other people underneath. The humorous video increased participants' tendency to favor the unconventional utilitarian solution, which entails a deontological violation (pushing the stranger off the bridge). Explaining their results, [Valdesolo and DeSteno](#) claimed that positive affect attenuates the negative affect that would normally accompany the deontological violation. We will call this account the *negativity-diminishment hypothesis*, which resembles the *undoing hypothesis* of [Fredrickson, Mancuso, Branigan, and Tugade \(2000\)](#) (an outgrowth of the broaden-and-build theory whereby positive emotions 'undo' the cognitive and physiological effects of negative emotions).

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Meanwhile, in recent years, an alternative view of emotions has gained traction. The appraisal-tendency framework (ATF; Lerner & Keltner, 2000) posits that the influence of an emotion stems from multiple dimensions. Emotions that have the same valence nevertheless differ in terms of properties associated with their unique cognitive, motivational, and social functions. ATF has been successfully tested for negative emotions (Lerner, Small, & Loewenstein, 2004), although it remains largely untested for positive emotions.

Under the appraisal-tendency hypothesis, Valdesolo and DeSteno's (2006) results may not be related to positive affect, but rather to the distinct properties of *mirth*, the positive emotion associated with humor (Martin, 2007). Although an appraisal tendency for mirth has not previously been articulated, we will suggest one here. A central property of humor is that topics—particularly those usually afforded deep respect—are taken lightly. Therefore, mirth's appraisal tendency may be to increase irreverence and remove the gravitas of otherwise serious ideas. In the context of moral judgment, this suggests that mirth would increase permissiveness for moral violations, including deontological violations.

If this explanation is correct, then other positive emotions might not have the same effect on moral judgments. The alternative positive emotion that we consider here is *elevation*, which arises from witnessing acts of moral beauty, and establishes a mindset whereby people want to act in a more noble, saint-like way (Haidt, 2003). While both mirth and elevation are positively valenced, they oppose each other in at least one dimension: while elevation is associated with reverence, mirth is associated with irreverence. Furthermore, elevation has been shown to increase the motivation to help others, whereas mirth does not (Algoe & Haidt, 2009). When it comes to footbridge-type moral dilemmas, elevation might make people less likely to endorse the violence or direct harm entailed by utilitarianism, instead encouraging decisions that seem “decent” rather than cold and calculating.

Given these considerations, our research has two related objectives. First, we investigate the extent to which positive affect necessarily increases utilitarian moral judgment. Second, we investigate whether particular positive emotions can have consequentially distinct influences on judgment and decision-making. The results of our study have implications for both moral cognition and the study of emotion.

2. Empirical approach

To achieve our objectives, we have devised a new *interleaved emotion-induction procedure*, which includes multiple trials for each participant. On each trial, an emotion-induction stimulus was presented, a participant rated his or her degree of emotional response to it, and then rated the permissibility of a deontological violation in a moral dilemma presented immediately afterwards. Across trials, multiple induction stimuli and moral dilemmas occurred, enabling us to measure the degree of induced emotion and how much it affected permissibility ratings. To avoid

complex interactions between qualitatively different emotional states, we had each participant serve under only one emotion-induction condition.

Our procedure has several advantages. It provides repeated measures of the effects caused by induced emotions, testing to what extent they occur reliably across individual induction stimuli and moral dilemmas. This approach has considerably more power and generality than single-trial methods, which involve many fewer (and possibly idiosyncratic) stimuli. Such power and generality may be especially important when assessing subtle effects of emotions like mirth and elevation.

3. Method

3.1. Preliminary norming study

Before our main experiment, we conducted a preliminary stimulus-norming study. Thirty audio clips were assembled for each of three emotion-induction conditions: mirth, elevation, and neutral control. For the mirth condition, audio clips were taken from the stand-up comedy of Jerry Seinfeld, Mitch Hedberg, Steven Wright, and Demetri Martin, whose observational humor is funny but not overtly aggressive or offensive. For the elevation condition, we extracted inspirational stories from a volume of *Chicken Soup for the Soul* (Canfield, 2002). Audio clips based on these extracts were recorded by four student actors (two male, two female). For the neutral (control) condition, we used lectures by four professors (two male, two female) from the *Science and the City* podcast. These stimuli were chosen to be engaging but not to contain contentious social or political content. Each clip lasted 3.5–4 min.¹

Each of 62 participants was assigned randomly to one of the three conditions. For each audio clip, a participant answered several questions about it on Likert rating scales. These questions measured general positive affect and specific degrees of induced mirth, elevation, and interest (Table 1). Not all questions were asked in all conditions, both because this would have made the study too long for each subject to rate all clips, and because it was thought that some questions might have dual meanings depending on the condition (for instance, stand-up comedy might be considered “uplifting” in a qualitatively distinct way from acts of moral beauty, and we did not want to falsely conflate these measures). Ratings in response to questions that assessed degrees of mirth (funny, laughing, smiling) and elevation (uplifting, inspiring, tearing, chest warmth, message) were positively correlated with rated positive affect, confirming that these are both positive emotions (Table 2).

3.2. Stimuli for main experiment

3.2.1. Emotion induction

To assess the effects of positive emotions on moral judgments in the main experiment, we used 12 audio clips for each of three emotion-induction conditions: mirth, ele-

¹ The complete set of emotion-induction stimuli can be found at <http://www-personal.umich.edu/~humean/stims.html>

Table 1
Mean ratings in response to emotion-induction stimuli in the preliminary norming study.

Variable	Condition			Question	
	Elevation	Mirth	Neutral		
Valence	3.78	3.43	**>	2.62	Overall, did you have positive or negative feelings when listening to this clip?
Engaging	3.35	2.95		2.05	How engaging did you find this clip?
Uplifting	3.47	**>		1.58	How uplifting did you find this clip?
Inspiring	3.46				How inspiring did you find this clip?
Tearing	1.38				Did you find your eyes tearing up when listening to this clip?
Warmth	2.12				Did you feel warmth in your chest when listening to this clip?
Message	4.19	**>	3.21	2.89	Overall, did you think that this clip had a negative or a positive message?
Funny		3.03	**>	1.34	How funny did you find this clip?
Laughing		2.69			How much did you find yourself laughing during this clip?
Smiling	1.81	<**	3.02	**>	How much did you find yourself smiling during this clip?
Interesting				2.2	How interesting did you find this clip?

Note: "Variable" indicates labels for predictors used in subsequent analyses. Ratings were made on 1–7 Likert scales. Statistically reliable contrasts, controlling for valence, are indicated by **> and <**. Blank entries indicate the questions was not asked under that condition.

Table 2
Correlations between ratings about emotion variables and positive valence in the preliminary norming study.

	Variable	Correlation with (positive) valence
<i>Elevation-related</i>	Uplifting	0.57 ($t = 12.3$)
	Inspiring	0.59 ($t = 12.1$)
	Tearing	0.24 ($f = 4.15$)
	Warmth	0.51 ($f = 8.4$)
	Message	0.65 ($t = 15.47$)
<i>Mirth-related</i>	Funny	0.73 ($t = 17.3$)
	Laughing	0.69 ($t = 16.0$)
	Smiling	0.68 ($t = 15.69$)

Note: Pearson product–moment (r) correlation coefficients. t -values associated with the tests are all reliably different from zero ($p \leq 0.0001$).

vation, and neutral control. These clips were selected from the larger sets of the preliminary norming study with the goal of maximizing relevant affective experiences and min-

Table 3
Mean values of ratings associated with emotion-induction stimuli used in the main experiment.

Variable	Condition		
	Elevation	Mirth	Neutral
Valence	3.86	3.57	2.53
Engaging	3.23	3.06	2.11
Inspiring	3.57		
Message	4.28	3.28	2.74
Uplifting	3.61		1.50
Funny		3.22	1.06
Laughing		2.28	

Note: Numerical values come from 1 to 7 Likert scales and represent the mean ratings for audio clips selected from stimuli in the preliminary norming study. Blank entries indicate that particular questions were not asked in some conditions.

imizing other irrelevant experiences while keeping overall valence high and nearly equal across the positive-emotion conditions. Table 3 shows the mean parameters of the audio clips selected for the main experiment.

3.2.2. Moral dilemmas

The experiment used 24 moral dilemmas similar to the footbridge problem (Greene, Sommerville, Nystrom, Darley, & Cohen, 2001), modified to have third-person phrasing.

3.3. Participants

Participants (29 females, 26 males) in the main experiment were native English-speaking, American undergraduates who received either course credit or payment.

3.4. Design and procedure

Participants wore headphones while sitting in front of a computer with a display monitor at eye level and a keypad nearby. Each participant was assigned randomly to one of the three emotion conditions. There were 12 successive trials, each involving a randomly paired emotion-induction clip and moral dilemma. No clip or dilemma was presented more than once per participant.

On each trial, a participant heard an audio clip and then rated it on a 1–6 scale appropriate to the assigned condition: 1 = not at all funny/uplifting/interesting, 6 = extremely funny/uplifting/interesting. After making this rating by using the keypad, the participant read a moral dilemma displayed on the computer monitor, and rated how permissible a deontological violation was on a 1–6 scale (1 = "forbidden", 6 = "completely permissible"). Each participant gave permissibility ratings for 12 of the dilemmas.

Table 4

Summary of the relationships between ratings of emotion-induction stimuli and permissibility ratings in the main experiment, controlling for positive valence.

	Standardized predictor variable	Coefficient estimate	
<i>Elevation-related</i>	Uplifting (main experiment)	–0.04	($t = 0.42, p = 0.67$)
	Uplifting (norming study)	–0.01	($t = 0.11, p = 0.91$)
	*Tearing (norming study)	–0.20–0.16	($t = 2.52, p = 0.01$)
	*Warmth (norming study)		($t = 2.04, p = 0.04$)
	Inspiring (norming study)	–0.12	($t = -1.4, p = 0.16$)
	*Inspiring + tearing + warmth	–0.22	($t = -2.87, p = 0.004$)
<i>Mirth-related</i>	*Funny (main experiment)	0.22	($t = 2.34, p = 0.02$)
<i>Neutral-related</i> (Positive) valence	Interest (main experiment)	–0.11	($t = -1.23, p = 0.22$)
	Valence (norming study)	–0.01	($t = -0.08, p = 0.94$)

Note: The estimates are coefficients for standardized predictors obtained from mixed-effects linear regression models using mean valence ratings from the initial norming study as covariates. The t -values and p -values come from statistical tests about whether these coefficients differ reliably from zero. “*” indicates coefficients that are reliably different from zero at the $\alpha = 0.05$ level.

3.5. Results

To analyze our data we used mixed-effects linear regression models (Baayen, Davidson, & Bates, 2008; Gelman & Hill, 2006), which quantified systematic relationships between trial-by-trial permissibility ratings and predictor variables based on emotion ratings from the main experiment and preliminary norming study.

One of our regression models tested whether positive valence was sufficient to account for the obtained permissibility ratings. It had the form *permissibility-rating* = *positive-valence* + *participant-random-effect* + *dilemma-random-effect* + *trial-number*. Here *permissibility rating* corresponded to individual moral judgments made on each trial using the 1–6 scale described previously. *Positive-valence* corresponded to mean ratings of “positive feeling” obtained in the preliminary norming study for each induction stimulus presented on trials of the main experiment. Another augmented regression model added *emotion-clip-rating* to the right side of the preceding equation. It tested to what extent permissibility ratings depended on the strength of the target emotion induced on each trial. *Trial* did not significantly predict permissibility ratings in any of the models.

Positive-valence effects. Subjective positive valence induced by audio clips did not account reliably ($p > .4$) across trials for permissibility ratings about moral dilemmas; $t = 0.29, -0.07$, and -0.85 in the mirth, elevation, and neutral conditions, respectively. Combining conditions, there was still no reliable effect of positive valence ($t = -0.50, p > .6$). Furthermore, when other condition-specific predictors (i.e., “funniness”, “uplifted”, and “interest”) were taken into account, the correlation between permissibility ratings and positive valence was essentially zero (Table 4). Such null results cast doubt on the sufficiency of Valdesolo and DeSteno’s (2006) negativity-diminishment hypothesis.

Mirth effects. For the mirth condition with positive-valence effects partialled out, trial-by-trial “funniness” ratings about the humorous audio clips in the main experiment accounted well for permissibility ratings (Table 4). There was a reliable ($t = 2.34, p = 0.02$) positive partial correlation: the higher the rated “funniness”, the more the participants tended to favor deontological violations (Fig. 1). This

confirms our prediction based on the hypothesis that mirth has an appraisal tendency of irreverence.

Elevation effects. For the elevation condition with positive-valence effects partialled out, trial-by-trial “uplifted” ratings obtained in response to the audio clips of the main experiment did not, by themselves, account reliably ($t = 0.42, p = 0.67$) for permissibility ratings about the moral dilemmas. This outcome might conceivably be explained in two ways: our theorizing about emotional elevation is incorrect, or “uplifted” ratings are not the best indicator for the presence of elevation.

Consistent with the second possibility, Silvers and Haidt (2008) found that elevation may be better measured through ratings of subjective inspiration and self-reported physiological responses such as eye watering. Hence, we performed an additional regression analysis with another proxy measure for the induced degree of elevation in the main experiment, using sums of the “inspiring”, “tearing”, and “chest warmth” ratings from our preliminary norming study. This predictor accounted reliably ($t = -2.87, p = 0.004$) for permissibility ratings in the elevation condition. Audio clips that had previously elicited higher ratings for these properties of elevation predicted lower permissibility ratings for the moral dilemmas (Table 4 and Fig. 2). (Indeed, all of the elevation predictors have negative coefficients.) When this latter trend is compared to what happened in the mirth condition, there is a reliable cross-over interaction ($t = 3.68, p = 0.0003$). These findings cast further doubt on the negativity-diminishment hypothesis while supporting the appraisal-tendency hypothesis.²

² One, though not the only, possible explanation for the cross-over between the mirth and elevation regression lines in Fig. 2 could involve anchoring-and-adjustment strategies described by Tversky and Kahneman (1974). According to this explanation, participants in each emotion condition may have distributed their permissibility ratings around implicit intermediate “anchoring points” on our rating scales. If so, then given that especially potent mirth stimuli induced relatively high permissibility ratings whereas especially potent elevation stimuli induced relatively low permissibility ratings, the respective regression lines relating permissibility and emotion ratings in these two conditions should necessarily cross each other, even though the appraisal-tendency hypothesis holds for trials involving the most potent induction stimuli.

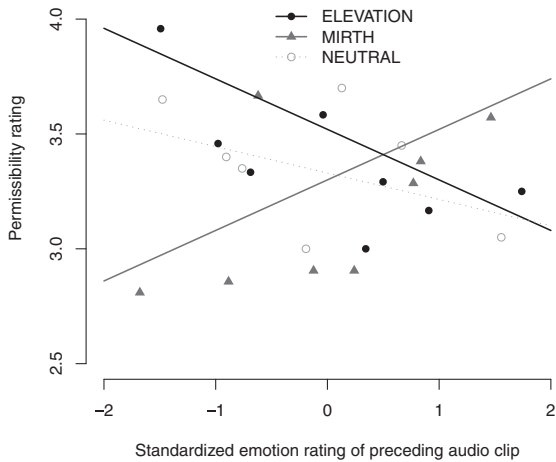


Fig. 1. Permissibility ratings for deontological violations in moral dilemmas in the main experiment as a function of rated emotional experiences induced by preceding audio clips. The emotion ratings for the clips pertain to *funny* in the mirth condition, a sum of *tearing*, *chest warmth*, and *inspiration* in the elevation condition, and *interesting* in the neutral condition (see Table 4). The regression lines are based on coefficient estimates for predictor variables used in mixed-effects linear regression modeling (with standardized predictors), which demonstrate opposing effects of mirth and elevation on moral judgments. The plotted points represent means from approximately equal-size bins, each of which sums over about 20 trials. Mixed-effects statistical tests indicate that the slopes for the mirth and elevation conditions are reliably different from zero and from each other. The mirth slope is also different from neutral; see text for more details.

“Interesting” control effects. For the neutral condition, trial-by-trial ratings of “interest” induced by the audio clips did not account reliably ($t = 1.23, p = 0.22$) for permissibility ratings in response to the moral dilemmas. With positive valence partialled out, these ratings had correlations and regression slopes close to zero (Table 4 and Fig. 1).

Furthermore, when one takes the top-rated emotion clip (or clips in the case of a tie) for each participant—the funniest, most interesting, or most elevating—a reliable linear trend emerges in the permissibility ratings across the three emotion conditions, with mirth leading to the highest mean permissiveness and elevation the lowest (Fig. 2), $t(51) = 2.44, p = 0.018$.³

4. Discussion

We found that mirth promotes tolerance of deontological violations in moral dilemmas, whereas elevation promotes rejection of such violations. Contrary to the negativity-diminishment hypothesis, our results cannot be explained simply in terms of positive affect. Instead, the present study supports the view that positive emotions are functionally distinct, and influence decision-making according to emotion-specific appraisals. The opposing effects of mirth and elevation on permissiveness towards deontological violations suggest that specific properties

³ As with the main analysis, the selection of the maximal trials in the elevation condition was based on a combination of “inspiring”, “tearing”, and “chest warmth” ratings for stimuli during the preliminary norming study.

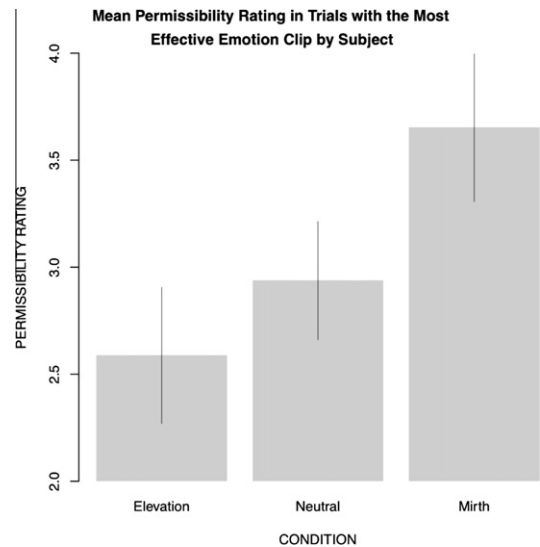


Fig. 2. Mean permissibility ratings obtained in the three emotion conditions of the main experiment for trials involving clips that had the most powerful experiences of the emotions. Confidence intervals indicate standard errors around group means.

of positive emotions can have substantially different consequences for human cognition and action.

While we have made progress toward understanding the nature of positive emotions, a number of explanations for our observed effects remain. Earlier in this paper we suggested that mirth’s appraisal tendency might be increased irreverence, leading to higher permissiveness for deontological violations. This suggests that mirth would not be discriminating in the types of moral behavior it would condone; indeed, if our moral dilemmas were rephrased to probe the acceptability of *utilitarian* violations, we may well find that mirth also increased permissiveness for these actions as well. It is nonetheless possible that mirth specifically favors deontological violations, for example because they represent an especially strong form of irreverence. At the very least, the findings of Valdesolo and DeSteno (2006) were not due to an idiosyncratic relationship between the original footbridge problem (which involves a fat stranger) and a comedy starring Chris Farley (an elephantine man who would make conspicuously good ballast).⁴

There is less ambiguity in the finding that elevation lowers permissibility ratings. Our clear prediction was that elevation would lower permissiveness because elevation is associated with moral reverence. It may not be a coincidence that elevation is associated with moral precursors like affiliation, empathy, and helping, which are the same tendencies proposed to be driving decisions about deontological solutions to footbridge-type moral dilemmas

⁴ In our own data, the four comedians we used had comparably strong effects on moral judgments. This may be due, in part, to the fact that we specifically picked similarly inoffensive comics to rule out the role of overt aggression and taboo breaking. It would be interesting to see if the observed mirth effect becomes still stronger when one uses off-color humor, or if mere irreverence is the only important factor.

(Koenigs et al., 2007; Mendez, Anderson, & Shapira, 2005). It is critical to note that elevation does not influence all aspects of morality equally; for instance, increased elevation did not make subjects more attuned to saving the most lives. Instead, elevation appears to activate and amplify moral responses unrelated to simple utility maximization.

In the future, methods like those used here may have useful applications for a variety of other investigations regarding the functional effects of emotion. Interleaved emotion-induction differs from standard mood-induction procedures in that it allows the experimenter to measure emotion induction on a trial-by-trial basis. The increased power of this approach stems from both its repeated-measures design and its sensitivity to individual self-reports about the strength of emotion felt at the start of each moral-judgment trial. These reports were augmented with information gathered about specific items in an independent norming study involving the same population. Such methods may be especially useful when inducing emotions that require stimuli for which there is a high degree of individual variation in personal reactivity, as is the case with mirth and elevation.

The present research also bears on other recent explanations of moral decision-making, which emphasize its grounding in both cognitive and affective systems (Greene & Haidt, 2002). We have demonstrated that such decisions may be modulated indirectly—in different ways—by emotions induced with stimuli separate from the targets of the decisions themselves. Such distal effects are not necessarily implied by an assumption that moral decisions involve an immediate proximal affective process. Our results thus provide significant new evidence to constrain theories about the overall relationship of moral and affective processing.

Furthermore, these constraints add nuance to the popular view that positive emotions uniformly promote good or beneficial behavior. Given that mirth and elevation have opposing effects on moral judgment, it makes little sense to describe such positive emotions as bringing about a 'desirable' outcome in this setting. Rather, these effects reflect the emotion's function and the context in which it is placed. Positive emotions may be *functional*, but this is distinct from claiming their effects are unambiguously *positive* (Campos, 2003; Norem & Chang, 2002). Moving away from normative labels will let us better appreciate the nature of positive emotions: their properties, functions, and relation to one another.

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