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## Stereotypes and Schadenfreude: Affective and physiological markers of pleasure at outgroup misfortunes

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### Abstract

People often fail to empathize with outgroup members, and sometimes even experience *Schadenfreude*—pleasure—in response to their misfortunes. One potent predictor of *Schadenfreude* is envy. According to the Stereotype Content Model, envy is elicited by groups whose stereotypes comprise status and competitiveness. These are the first studies to investigate whether stereotypes are sufficient to elicit pleasure in response to high-status, competitive targets' misfortunes. Study 1 participants feel least negative when misfortunes befall high-status, competitive targets as compared to other social targets; participants' facial muscles simultaneously exhibit a pattern consistent with positive affect (i.e., smiling). Study 2 attenuates the *Schadenfreude* response by manipulating status and competition-relevant information; *Schadenfreude* decreases when the target-group member has lowered status or is cooperative. Stereotypes' specific content, and not just individual relationships with targets themselves, can predict *Schadenfreude*.

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How do people respond to competitive groups' hardship? Often people experience pity or empathy when they see other people suffering. *Schadenfreude*, in contrast, refers to the perceiver's experience of pleasure at another's misfortune (Heider, 1958). At least three conditions commonly predict *Schadenfreude* (Smith et al., 2009): when observers gain from the misfortune (Smith, Eyre, Powell, & Kim, 2006); when another's misfortune is deserved (Feather, 1999, 2006; Feather & Nairn, 2005; van Dijk, Ouwerkerk, Goslinga, & Nieweg, 2005); and when a misfortune befalls an envied person (Smith et al., 1996; Takahashi et al., 2009).<sup>1</sup> For example, college students report feeling more *Schadenfreude* in response to another student's academic failure when the target is an overachiever as opposed to average (van Dijk et al., 2006).

Envy, however, is not reserved only for individual targets (Fiske, Cuddy, & Glick, 2002, 2007; Smith & Kim, 2007). Given that emotions just as easily operate at the inter-group level as at the inter-personal level (see E.R. Smith, 1993; Tiedens & Leach, 2004), merely encountering a successful outgroup may *imply* one's comparative inferiority, engendering group-based envy (R.H. Smith, 1991; Tajfel & Turner, 1979) and potentially *Schadenfreude* when the outgroup or one of its members suffers a misfortune. Indeed, Leach and colleagues (2003) have demonstrated that *objective* ingroup inferiority (i.e., losing in a competition), and subjective feelings of inferiority (Leach & Spears, 2008; 2009) lead to *Schadenfreude* toward third-party groups that suffer subsequent losses. Previous studies examining intergroup *Schadenfreude*, however, have employed well-defined, categorical, overtly

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<sup>1</sup>A few studies have challenged this last relationship by failing to document an association between envy and *Schadenfreude* (e.g., Hareli & Weiner, 2002), or by identifying boundary conditions (e.g., envy predicts *Schadenfreude* when the target is a *relevant* social comparison other, for example, the same gender as the participant; van Dijk et al., 2006).

competitive groups (i.e., rival universities, political parties, soccer teams, e.g., Combs et al., 2009). Here we examine whether mere stereotype content is sufficient to elicit Schadenfreude. In other words: Can a high-status group, merely by who they are, and not by what they have done, evoke malicious joy at their misfortunes?

Recent research in social cognition firmly establishes that people differentiate each other not simply along an ingroup/outgroup boundary, but also by the extent to which they (dis)like and (dis)respect a target. The Stereotype Content Model (SCM; Fiske et al., 2002, 2007) organizes beliefs about social groups along two fundamental dimensions: perceived warmth and competence. Whether a social group is cooperative or competitive will determine if they apparently have *intent* to harm the culturally dominant group (or ingroup), which guides people's perceptions of that social group's *warmth*. Likewise, whether a social group has high or low status will determine if they apparently have *capability* to harm the ingroup, which guides perceptions of the group's *competence*. This 2 (low/high warmth) X 2 (low/high competence) mapping describes four broad stereotype categories and the emotional responses those categories elicit. Groups high on both warmth and competence (e.g., "Americans") elicit pride, whereas groups low on both warmth and competence (e.g., drug addicts) elicit disgust. Groups falling in the mixed quadrants elicit ambivalent emotions; pity is elicited by people perceived as low in competence and high in warmth (e.g., elderly), whereas envy is reserved for people perceived as high in competence but low in warmth (e.g., the rich, Asians, Jews, business women).

We predict that knowledge of a group's stereotype will spontaneously activate envious prejudice when the stereotype comprises status (associated with competence) and competitiveness (associated with coldness; Fiske et al., 2002). Although high-status is a given—envy requires an upward comparison—we posit that competitiveness is also crucial, as people can have positive, upward, emotional responses such as inspiration in response to cooperative high-status groups (R. Smith, 2000). If stereotypes are sufficient to activate envious prejudice, Schadenfreude may occur even if the envied group is not presented in an explicitly competitive context (e.g., an opponent in a game). This is particularly important as it suggests that groups need not have a long history of interaction to elicit these malevolent affective reactions. Furthermore, examining the effects of social structural variables (i.e., status and competitiveness), not the groups themselves, allows predictions about responses to any social group based solely on stereotype content.

In Study 1, participants respond to positive, negative, and neutral events happening to a variety of targets from the SCM. We hypothesize that participants will feel more positive about negative events that happen to high-status, competitive (i.e., envied) targets, as compared to targets from the other 3 SCM quadrants. Participants, however, may not explicitly report Schadenfreude, due to social desirability constraints. Previous studies of Schadenfreude report means ranging from 1 to 3.6 on 7-point scales assessing Schadenfreude (Leach et al., 2003; Leach & Spears, 2008; Smith et al., 1996; van Dijk et al., 2005), suggesting that even when the target's superior status is made explicit (i.e., superior academic achievement, victory in a sporting event), self-reported means do not indicate high levels of Schadenfreude. To address this issue we supplement self-report with physiological measures: to the extent that participants are experiencing more positive affect (*not just neutral affect*) in response to high-status, competitive targets' misfortunes, we predict greater smiling during negative events when they happen to those as compared to other targets.

Study 2 attempts to attenuate participants' Schadenfreude to high-status, competitive targets' misfortunes by providing counter-stereotypic information about an exemplar from the target's group. If high-status and competitiveness are sufficient to predict Schadenfreude in

response to misfortune, then increasing cooperation or decreasing status should reduce it, demonstrating that stereotype content, and not specific relationships to individual targets themselves, predicts pleasure at their misfortunes.

## Study 1

Facial electromyography (EMG) research demonstrates that the zygomaticus major (a cheek muscle, engaged during smiling) response is closely linked with subjective experience of positive affect (Brown & Schwartz, 1980). Facial EMG is a reliable, indirect measure of affect, and a crucial supplement to self-report, given that expression of Schadenfreude is likely constrained by social desirability effects (Lanzetta & Englis, 1989).

## Method

**Participants**—Twenty (9 female,  $M_{\text{age}} = 22.0$ ) university students were recruited online. Written informed consent from each participant and experimental procedures complied with the guidelines of the university's IRB.

**Procedure**—Participants learned that they would be participating in a study of the brain-wave correlates of outcome perception and that electrodes would measure brain signals while they passively viewed pictures of people paired with written events, which they were supposed to imagine happening to the person in the photograph. In reality, EMG electrodes on the participant's face measured muscle activity. Such cover stories draw participants' attention away from their facial movements and reduce intentional response suppression (Fridlund & Cacioppo, 1986). Participants expressed no suspicion during post-experiment debriefings.

In the first part of the experiment, each trial followed the same format: First, a screen instructed participants to relax and press the space bar to begin. For 4 seconds, participants saw "Continue to relax"; we recorded a baseline measure of facial activity during the last 2s. Then the participant saw the target-event pair for 4s. We recorded facial reactions for the duration of the 4s exposure time. Then participants reported their affective responses to the target-event pair using a keyboard.

In the second part of the study, participants saw pictures of all of the targets from the SCM without any events. After viewing a photograph of the target for 4 seconds, participants assessed the warmth and competence of the target.

**Stimuli**—A pilot sample ( $N=29$ ) rated the three types of events (without SCM targets) to confirm that they were perceived as negative, neutral, and positive, respectively. On a scale ranging from 1 (*extremely negative*) to 10 (*extremely positive*), negative events were rated most negative ( $M=3.61$ ,  $SD=.58$ ), followed by neutral events ( $M=6.38$ ,  $SD=.51$ ; note that 5.5 is the midpoint of the scale), and positive events were rated most positive ( $M=8.40$ ,  $SD=.50$ ). Although the neutral events pretested between positive and negative events, their mean rating above the scale midpoint makes interpretation ambiguous, so their results are not discussed further.

Each participant saw and rated 27 events: 9 positive, 9 neutral, and 9 negative events (see Supplementary Online Materials for complete list of events). Each event was seen 4 times, randomly paired each time with a picture of one person from each SCM quadrant in turn (i.e., a 'pride,' 'envy,' 'pity,' and 'disgust' target, respectively); 27 events, each paired once with each quadrant, yielded 108 event-target pairs total (Figure 1).<sup>2</sup>

The target images were drawn from a bank of 48, which included 12 images per quadrant. Not every participant saw the same sample of images because they were sampled without replacement within event type (i.e., positive, neutral, negative). In other words, a specific target from a given quadrant could be randomly paired with a positive, negative, or neutral event (or some subset) over the course of the study, but never 2 positive events. These pictures have been previously validated as evoking the predicted emotional responses (Harris & Fiske, 2006). For clarity, we use each quadrant's corresponding emotion instead of status/competitiveness to reference quadrants from here onward.

### Dependent Variables

**Self-reported reactions:** Participants answered two questions after each target-event pair, "How GOOD [BAD] would this make you feel?" Participants were instructed to answer each question in response to the *target's experience* in order to minimize ambiguity regarding about what they should report feeling good and bad. We also asked two questions after each SCM target-alone trial: "As viewed by society, how COMPETENT/WARM is this person?" In contrast to the affect ratings, which are made from the first-person perspective, the phrasing of the warmth and competence questions frees respondents to report knowledge of stereotype content without endorsing said stereotypes. For all questions, the scale ranged from 1 (*not at all*) to 9 (*extremely*), and order of questions was counterbalanced between trials.

**EMG data acquisition:** See Supplementary Online Material for details.

## Results

### Behavioral Results

**Warmth and competence:** A 2 (competitive/cooperative target) X 2 (low/high status target) within-subjects ANOVA predicting warmth revealed the predicted effect of competition,  $F_{\text{competition}}(1,19) = 88.31, p < .001, \eta^2_p = .82$ , and a significant effect of status,  $F_{\text{status}}(1,19) = 9.32, p < .01, \eta^2_p = .33$ ; these were qualified by a significant interaction,  $F_{\text{competition} \times \text{status}}(1,19) = 46.97, p < .001, \eta^2_p = .71$ . Specifically, pity targets were rated as most warm ( $M=5.86, SD=1.14$ ), followed by pride targets ( $M=5.38, SD=0.88$ ), then envy targets ( $M=4.60, SD=1.16$ ), and finally disgust targets ( $M=2.91, SD=1.17$ ); all pairwise  $t(19) > 3.91, p < .05$ . These findings support the prediction that pride and pity targets would be rated as warmer than envy and disgust targets.

A 2 (competitive/cooperative target) X 2 (low/high status target) within-subjects ANOVA predicting competence revealed a significant effect of competition,  $F_{\text{competition}}(1,19) = 55.84, p < .001, \eta^2_p = .75$ , and the predicted effect of status,  $F_{\text{status}}(1,19) = 213.24, p < .001, \eta^2_p = .92$ ; these were qualified by a significant interaction,  $F_{\text{competition} \times \text{status}}(1,19) = 39.42, p < .001, \eta^2_p = .71$ . Specifically, participants rate pride targets as most competent ( $M=6.68, SD=1.04$ ), followed by envy targets ( $M=6.39, SD=1.05$ ), then pity ( $M=3.85, SD=0.95$ ), and disgust targets ( $M=2.05, SD=0.79$ ); all pairwise  $t(19) > 7.82, p < .05$ , except pride-envy,  $t(19) = 1.91, p = .07$ . These findings support the prediction that pride and envy targets would be attributed more competence than pity and disgust targets.

**Event ratings:** A 2 (negative/positive event) X 2 (low/high warmth) X 2 (low/high competence) within-subjects ANOVA predicting how *bad* participants felt in response to the target-event pairs revealed a significant effect of event type,  $F_{\text{event}}(1,19) = 52.80, p < .001$ ,

<sup>2</sup>None of the events reflect good/bad intentions or more/less capability and therefore could not be more easily associated with some targets than others.

$\eta^2_p = .74$ , a significant effect of warmth,  $F_{\text{warmth}}(1,19) = 5.43, p < .05, \eta^2_p = .22$ , and a significant effect of target competence,  $F_{\text{competence}}(1,19) = 19.29, p < .001, \eta^2_p = .50$ . These main effects were qualified by significant two-way interactions— $F_{\text{event} \times \text{warmth}}(1,19) = 31.98, p < .001, \eta^2_p = .63$ , and  $F_{\text{event} \times \text{competence}}(1,19) = 5.42, p < .05, \eta^2_p = .22$ —which were qualified in turn by a significant three-way interaction  $F_{\text{event} \times \text{warmth} \times \text{competence}}(1,19) = 8.56, p < .01, \eta^2_p = .31$ . As predicted, participants reported that they felt least bad when *negative* events happened to envied targets ( $M=3.81, SD=1.85$ ) as compared to pride ( $M=4.17, SD=1.78$ ), pity ( $M=5.32, SD=1.83$ ), and disgust targets ( $M=4.41, SD=1.77$ ); pairwise  $t_s(19) = 2.05, p < .05$  (Figure 2).<sup>3</sup> Interestingly, participants felt most bad when *positive* events befell disgust ( $M=2.08, SD=1.08$ ) as compared to envy ( $M=1.59, SD=0.50$ ), pity ( $M=1.54, SD=0.63$ ), and pride targets ( $M=1.56, SD=0.64$ ); all pairwise  $t_s(19) = 2.15, p < .05$ . None of the other pairwise-comparisons for how bad people felt in response to positive events were significant; all  $t_s(19) < 0.5, ns$ .

A 2 (negative/positive event) X 2 (low/high warmth) X 2 (low/high competence) withinsubjects ANOVA predicting how *good* participants felt in response to the target-event pairs revealed a significant effect of event type,  $F_{\text{event}}(1,19) = 34.59, p < .001, \eta^2_p = .65$ , a significant effect of target warmth,  $F_{\text{warmth}}(1,19) = 3.95, p = .05, \eta^2_p = .17$ , and a significant effect of target competence,  $F_{\text{competence}}(1,19) = 3.99, p = .05, \eta^2_p = .17$ . These main effects were qualified by a significant two-way interaction,  $F_{\text{event} \times \text{warmth}}(1,19) = 20.26, p < .001, \eta^2_p = .52$ , and a marginal two-way interaction,  $F_{\text{event} \times \text{competence}}(1,19) = 2.93, p = .10, \eta^2_p = .13$ . The three-way interaction was not significant. As suspected, participants were not willing to report that they felt significantly *better* (i.e., higher scores on “how good would you feel) when *negative* events happened to envied targets ( $M=2.04, SD=0.68$ ) as compared to pride ( $M=1.63, SD=0.81$ ), pity ( $M=1.68, SD=1.06$ ), and disgust targets ( $M=1.81, SD=0.99$ ); all pair-wise  $t_s(19) < 1.5, ns$ , except envy-pride,  $t(19) = 2.33, p < .05$ . We ran a follow up 3:1 contrast examining how good people felt in response to negative events, comparing envy to the other three groups: the contrast was not significant,  $F_{\text{target}}(1,19) = 1.88, p = .13, \eta^2_p = .09$ .<sup>4</sup>

**ZM Responses**—Because participants did not report overt Schadenfreude, we were even more confident that an implicit measure of positive affect was necessary to help circumvent potential social desirability concerns. As predicted the ZM response to negative events was significantly greater when they were paired with envy targets as compared to pride,  $F(1,19) = 5.33, p < .05, \eta^2_p = .22$ , pity,  $F(1,19) = 4.29, p = .05, \eta^2_p = .18$ , and disgust targets,  $F(1,19) = 6.26, p < .05, \eta^2_p = .25$ . That said, participants’ facial EMG responses might be more sensitive to the photographs than to the events (or a combination thereof): For example, participants may have had greater ZM responses to envy targets across all event types, including negative event types. To test the relative effect of positive and negative events on the same set of photographs, we computed a difference score, subtracting “ZM in response to negative events” from “ZM in response to positive events” (negative scores indicate more smiling in response to negative as compared to positive events). Indeed, the ZM difference score for envy targets significantly differed from the score for pride,  $F(1,19) = 4.23, p = .05, \eta^2_p = .18$ , pity,  $F(1,19) = 5.30, p < .05, \eta^2_p = .22$ , and disgust targets,  $F(1,19) = 5.11, p < .05, \eta^2_p = .21$  (Figure 3).<sup>5</sup> Disgust, pity, and pride groups did not differ significantly from one another, pairwise  $t_s(19) = 1.1, ns$ ; envy is significantly different from

<sup>3</sup>Participants felt significantly less bad about negative events when they happened to disgust as compared to pity targets,  $t(19) = -4.35, p < .001$ , but not pride targets,  $t(19) = 0.95, ns$ ; they also felt significantly worse when negative events happened to pity as compared to pride targets,  $t(19) = 4.65, p < .001$ .

<sup>4</sup>We ran a follow-up study in order to ensure our findings were not due to our use of the two-item “good/bad” dependent measures. Using previously validated dependent measures of Schadenfreude (e.g., van Dijk et al., 2006; Leach et al., 2003), we find statistically equivalent means for self-reported Schadenfreude in response to envy targets’ misfortunes (see supplementary online materials).

0,  $t(19) = -1.85$ ,  $p < .05$ , one-tailed; however, none of the other conditions are,  $ts(19) = 1.5$ , *ns*.

We did not observe a correlation between ZM and self-reported affect in response to positive or negative events for any of the SCM targets. If we are correct, however, that social desirability changes people's self-reported affective responses to the target-event pairs, these null results are predicted: social desirability increases error in self-report measurement, rendering it less valid and less likely to covary with other measures.

We did not observe significant effects of target and event type for muscle groups other than ZM. We were nevertheless interested in the correlations *among* the muscle groups, given the well-established constellations of muscle engagement for positive (ZM and OO) and negative affect (CS), respectively. The ZM values reported in Figure 3 were positively correlated with corresponding OO values for disgust,  $r(18) = .63$ , envy,  $.89$ , pity,  $.61$ , and pride targets,  $.57$ , all  $ps < .05$ . This suggests that even though we did not observe significant effects of target and event type in OO overall, OO reliably responded in concert with ZM across the conditions. In contrast, and in line with the EMG findings differentiating the facial muscle correlates of positive and negative affect (e.g., Fridlund & Cacioppo, 1986), ZM was *negatively* related to CS across the 4 target types (positive-negative events),  $rs(18) = -.47, -.41^+, -.48, -.66$ ; the pattern was identical for the relationship between ZM and FM,  $rs(18) = -.43, -.36^+, -.53, -.45$ , all  $ps < .05$  (plus-signs indicate marginal trends).

## Study 2

The recent economic downturn is a convenient context to investigate perceptions of envied targets, as the socio-economic status hierarchy is less stable now than it has been in the last decade in the United States. When status relations are perceived as unstable, members of lower-status groups are likely to view the existing social hierarchy as changeable (Tajfel & Turner, 1986); perceptions of stereotyped groups and their members may be more malleable under these conditions.

The current study examines whether decreasing an envied target's status or increasing the target's cooperativeness will make people respond to envied targets' negative experiences more the way they respond to disgust, pity, or pride targets' experiences. Our prediction is that after being primed with stories about investment bankers who are lower-status, cooperative, or both, participants will report feeling bad when negative events happen to other targets who resemble investment bankers; in contrast, participants, who read about stereotypic investment bankers whose situation is status quo (high status, competitive), will replicate previous findings (i.e., feel relatively less bad when those same targets experience negative events). Because the manipulation focuses on a particular group within the envy quadrant (i.e., investment bankers), we expect participants to feel bad about negative events when they happen specifically to targets that resemble investment bankers. Ratings of other envied targets' negative experiences should remain unaffected by the manipulation: That is, reactions based on the counter-stereotypic stories should generalize to the stereotyped group, but not the "envy" quadrant as a whole.

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<sup>5</sup>We use difference scores for the ZM data analyses to control for the relative impact of the targets and events. In order to keep the behavioral analyses parallel, we also computed difference score results for the self-report data (i.e., how good participants feel in response to positive events minus how good they feel in response to negative events for each of the four targets; scores closer to 0 indicate that participants reported feeling equally good in response to positive and negative events). Envy targets' difference scores were significantly lower than pity,  $t(19) = -3.35$ ,  $p < .01$ , and pride targets,  $t(19) = -3.43$ ,  $p < .01$ ; the comparison between envy and disgust was marginally significant,  $t(19) = -1.72$ ,  $p = .05$ , one-tailed.

## Method

**Participants**—Only participants who correctly completed a manipulation check, and reported that they currently reside in the U.S., are included in the sample. An eligible 147 participants (96 female,  $M_{\text{age}}=37.4$ ) completed the web study for pay. Online informed consent and experimental procedures complied with the guidelines of the university's Institutional Review Board.

**Stimuli and Procedure**—In a between-subjects design, participants were randomly assigned to read one online newspaper article that emphasized one of the following (Figure 4): 1) investment bankers' economic situation is status quo (high-status and competitive: envy), 2) many bankers have been making an effort to work with small businesses to help the economy as a whole (decreases competitiveness: pride), 3) many bankers are unemployed but still dressing up in their suits and pretending to go to work, spending their days at Starbucks to give the impression they are employed (decreases status and competitiveness: pity), or 4) many bankers have happened on financial windfalls, due to the disorganization of their firms, and have been using the bonuses to buy drugs to support their addictions (decreases status: disgust).

Each condition was identical except for the final two paragraphs of the article (see Supplementary Online Materials for all four articles). After reading the article, participants completed the dependent variable measures and demographic information.

**Investment banker ratings:** A separate online sample of American participants ( $N=28$ , 18 female,  $M_{\text{age}}=39.11$ ) rated each of the envy targets on the extent to which he or she looked like an investment banker (1 = *not at all*, 7 = *extremely*). The three targets rated as most likely to be investment bankers were designated investment banker targets ( $M=5.17$ ); the three targets rated least likely to be investment bankers were designated "other envy" targets ( $M=2.46$ ).

**Dependent Variables**—Participants in Study 1 did not report both least negative affect and most positive affect to envy targets' misfortunes, suggesting that a bipolar scale sufficiently captures the self-report response variation. In this second study we use a bipolar scale to streamline the design.

After reading the priming article, main-study participants undertook an ostensibly different task. First, participants recorded their responses to nine negative events happening to nine different envy targets: "How would this make you feel? 1 (extremely bad) to 9 (extremely good).

On the next page, participants recalled the main character in the online article; they rated his warmth and competence. Third, as a manipulation check, participants described his behavior in the prime, to ensure they had actually read the entire article (the survey options prevented participants from navigating back to previous webpages). Finally, participants reported their own age, gender, ethnicity, and country of current residence.

## Results

Participants rated Chris Benson (the character in the newspaper article) as the SCM predicts: significantly less warm in the disgust ( $M=2.71$ ,  $SD=1.18$ ) and envy manipulations ( $M=3.46$ ,  $SD=1.17$ ) than in the pity ( $M=5.31$ ,  $SD=1.35$ ) and pride manipulations ( $M=4.59$ ,  $SD=1.29$ ),  $F_{\text{warmth}}(1, 143) = 44.49$ ,  $p < .001$ ,  $r_p^2 = .23$ ; significantly less competent in the disgust ( $M=2.63$ ,  $SD=1.31$ ) and pity manipulations ( $M=5.19$ ,  $SD=1.67$ ) as compared to the envy

( $M=5.62$ ,  $SD=1.21$ ) and pride manipulations ( $M=5.26$ ,  $SD=1.33$ ),  $F_{\text{competence}}(1, 143) = 78.16$ ,  $p < .001$ ,  $\eta_p^2 = .35$ .

Though participants viewed the exact same set of envy targets paired with negative events across all conditions, they responded differently depending on the priming article and whether the target was judged (by a separate sample) to resemble an investment banker. As predicted, a 2 (investment banker/other envy target) X 2 (high/low warmth prime) X 2 (high/low competence prime) ANOVA revealed a significant interaction between target type and warmth,  $F_{\text{target} \times \text{warmth}}(1, 143) = 8.29$ ,  $p < .01$ ,  $\eta_p^2 = .05$ , and target type and competence,  $F_{\text{target} \times \text{competence}}(1, 143) = 4.69$ ,  $p < .05$ ,  $\eta_p^2 = .03$ ; the three-way interaction was not significant. Specifically, neither the warmth nor competence of the investment banker in the prime had an effect on how participants felt about negative events befalling “other envy” targets who did not resemble investment bankers:  $F_{\text{warmth}}(1, 144) = 0.31$ , *ns*,  $F_{\text{competence}}(1, 144) = .14$ , *ns*,  $F_{\text{warmth} \times \text{competence}}(1, 144) = 0.16$ , *ns*. In contrast, both the warmth and competence of the investment banker in the prime had an effect on how participants felt about negative events befalling envy targets, who were rated as likely to be an investment banker,  $F_{\text{warmth}}(1, 144) = 5.92$ ,  $p < .05$ ,  $\eta_p^2 = .04$ ,  $F_{\text{competence}}(1, 144) = 4.49$ ,  $p < .05$ ,  $\eta_p^2 = .03$  (the interaction was not significant,  $F_{\text{warmth} \times \text{competence}}(1, 144) = 0.49$ , *ns*, Figure 5).

We ran a follow-up contrast examining how participants felt in response to negative events, comparing envy prime to the other three primes (3, -1, -1, -1), as moderated by the target type (most versus least likely to be an investment banker): The interaction between prime and target type was significant,  $t(143) = 3.18$ ,  $p < .01$ . Broken down by target type, the 3:1 contrast was significant for targets who resembled investment bankers,  $t(143) = 3.03$ ,  $p < .01$ , where as the contrast was not significant for targets who did not resemble investment bankers,  $t(143) < 1$ , *ns*. The interactions between target type and the two orthogonal contrasts (0, 1, -2, 1 and 0, 1, 0, -1) were not significant,  $ts < 1.7$ , *ns*.

## Discussion

The current studies examine whether stereotypes’ specific content (i.e., status and competitiveness) is sufficient to elicit Schadenfreude when targets suffer a misfortune. In Study 1, participants felt *least bad* about *negative* events, and *least good* about *positive* events when they happened to envy targets as compared to other targets; however, participants did not report feeling significantly better about negative events when they happened to envy as compared to other targets. To obtain implicit measures of positive affect, we recorded facial muscle responses, focusing on the ZM because it correlates with positive affect (e.g., Brown & Schwartz, 1980). For pride, pity, and disgust targets, participants exhibited a greater ZM response when the target was paired with a positive as compared to a negative event; only envy targets elicited greater ZM response when the target was paired with a negative as compared to positive event. Though participants did not want to explicitly report feeling pleasure when envy targets experienced a misfortune, these facial EMG findings provide preliminary evidence for the *presence of positive affect* (i.e., smiling)—not just the absence of negative affect—in response to envied targets’ misfortunes.

In Study 2, providing counter-stereotypic status and competition information about an investment banker changed participants’ subsequent ratings of negative events happening to novel envy targets; moreover, the effect was specific to those targets, who resembled investment bankers. Downstream effects of envious prejudice (i.e., Schadenfreude) can be attenuated for specific group members when perceivers are primed with situations in which the target group has lower-status or is cooperative.



Other factors, in addition to envy, predict Schadenfreude: anger and hate toward the target (Hareli & Weiner, 2002), perceived deservingness of the target (vanDijk, et al., 2005), and resentment (Feather & Nairn, 2005; Feather & Sherman, 2002). Recent research demonstrates that self-evaluation threat also increases Schadenfreude in response to other's misfortunes, above and beyond self-reports of envy and dislike for the target (van Dijk, Ouwerkerk, Wesseling, & van Koningsbruggen, in press). Envious prejudice is related to all of the above factors to some degree, and context or previous experience with the envied target may alter which predictors are most potent. Thus, rather than exploring the many emotions that may be mediators of the relationship between envy and Schadenfreude, the current framework uses systematic principles to predict which *targets* are most likely to be targets of envy, and whether they are also targets of Schadenfreude when they suffer misfortunes.

These studies extend the existing literature by demonstrating that perceived status and competition can determine when and which targets are most likely to evoke Schadenfreude. Second, they disrupt the deleterious consequences of envious prejudice by manipulating perceptions of status and competition. Finally, they highlight the importance of using a variety of methods to assess the relationships among stereotype content, envy, and Schadenfreude. Using indirect measures such as facial EMG to complement explicit self-report helps to circumvent some of the hurdles associated with measuring socially undesirable responses.

People often fail to empathize and may even feel pleasure in response to outgroup targets' misfortunes. However, not all outgroups are equivalent: high-status, competitive groups are more likely than other outgroups to be targets of Schadenfreude, as well as active harm (Cuddy et al., 2007). Knowing that perceptions of warmth and competence drive these responses allows us to predict which groups are at greatest risk in times of social instability. Furthermore, knowing that these perceptions are malleable makes it possible to ameliorate pernicious affective and behavioral responses when outgroups are targets of misfortune or overt harm.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

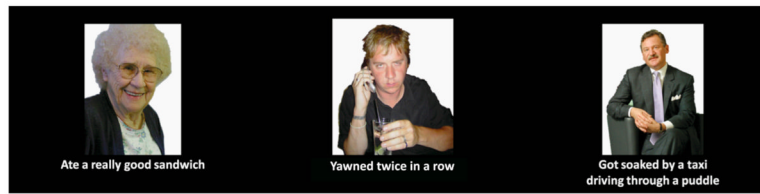
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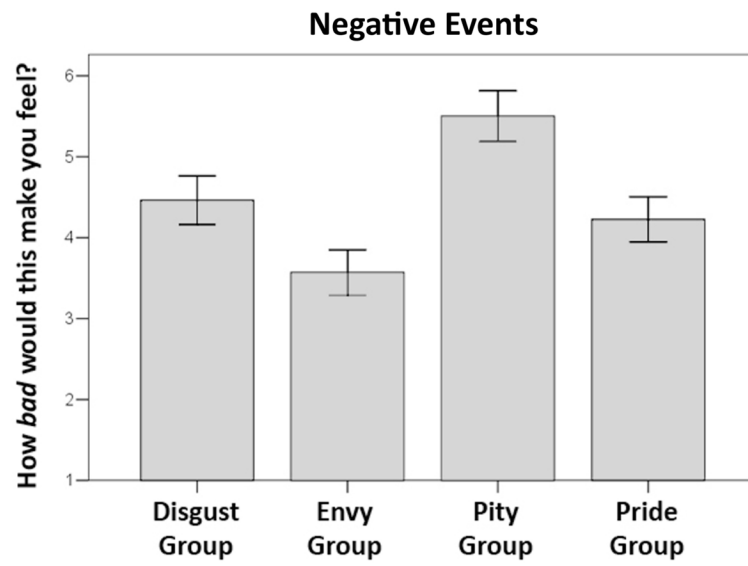
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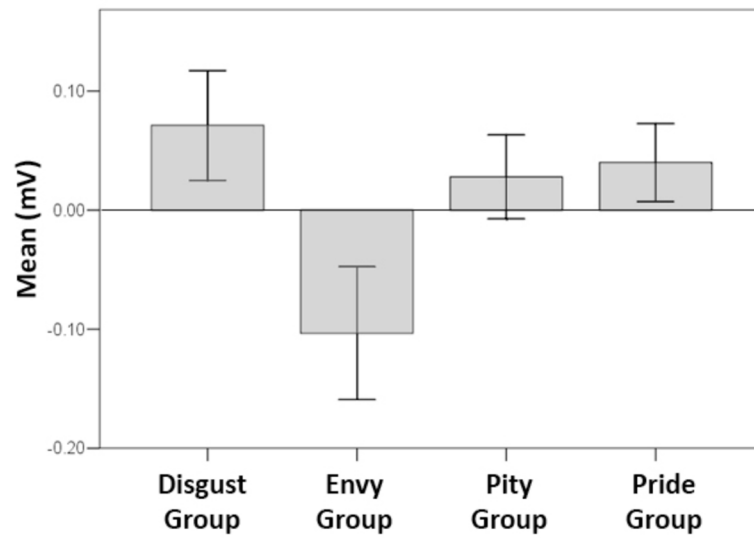
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**Figure 1.** Stimulus examples from Study 1: pity target/positive event, disgust target/neutral event, envy target/negative event.



**Figure 2.** Ratings of how *bad* participants would feel in response to *negative events*. Bars represent SE.



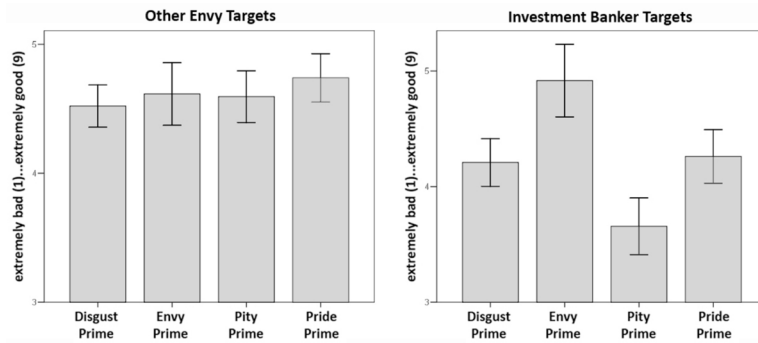
**Figure 3.** ZM response during negative events *minus* ZM response during positive events—only envy targets elicited more ZM response during negative as compared to positive events. Bars represent SE.

The screenshot shows a news website interface. At the top, there are navigation links for 'HOME PAGE', 'TODAY'S PAPER', 'VIDEO', 'MOST POPULAR', and 'TIMES TOPICS'. A search bar is located on the right. The main header is 'Global Business'. Below this, there are several sub-sections: 'Search Business' (with a search bar and 'Go' button), 'Financial Tools' (with a dropdown menu for 'Select a Financial Tool'), and 'More in Business' (with links for 'Global Business', 'Markets', 'Economy', 'DealBook', 'Media & Advertising', 'Small Business', 'Your Money', and 'Energy & Environment').

The main article is titled 'Investment bankers: One year later' by 'DAVID M. COOPER'. It features a photo of two men, one in a suit and one in a brown jacket, looking at a document. The text of the article begins: 'Chris Benson gets up early and drives past his neighbors' mansions on tree-lined streets in Westchester to catch the 6:10 train into the city. He carries several newspapers and his briefcase. On arrival, he walks rapidly in his designer suit to his first appointment. Before he heads to his downtown office Chris is meeting with Mr. Iacoboni, a local retailer, to discuss investment strategies. How can Mr. Iacoboni maximize his returns? How risky is too risky? Chris is one of many investment bankers who has volunteered to advise small businesses in order to keep them open and thriving in the economic downturn. Financial experts understand that greater numbers of stable businesses improve the economy as a whole. Thousand of bankers have taken similar measures, meeting with small business owners in their spare time. Participating businesses report that they are already seeing the benefits of collaborating with bankers and are optimistic about the continuation of this positive trend.'

On the right side of the article, there are social media sharing options: 'SIGN IN TO RECOMMEND', 'TWITTER', 'SIGN IN TO E-MAIL', 'PRINT', 'REPRINTS', and 'SHARE' (with a dropdown for 'ARTICLE FONTS'). Below these is a 'Next Article in Business (8 of 51)' section with a 'Customize your headlines' box featuring a LinkedIn logo and a 'Click here to activate' button.

**Figure 4.**  
Example of pride prime in Study 2.



**Figure 5.** Left: how people felt in response to “other envy” targets’ misfortunes as a function of the article prime. Right: how people felt in response to investment bankers’ misfortunes as function of the article prime. Bars represent SE.