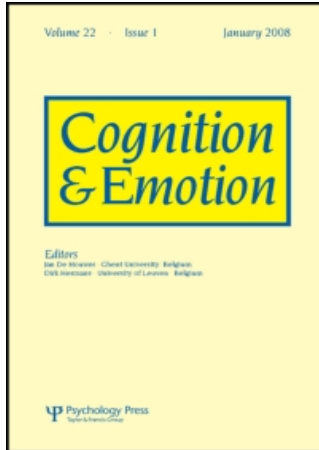


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### That's disgusting! ..., but very amusing: Mixed feelings of amusement and disgust

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BRIEF REPORT

**That's disgusting! . . . , but very amusing: Mixed feelings  
of amusement and disgust**

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This study examines mixed feelings of amusement and disgust. Participants ( $N = 102$ ) reported their affect before and after watching a film clip depicting disgusting humour. While watching the clip participants were instructed to take the perspective of either an uninvolved observer or of the clip's protagonist. As expected this clip produced mixed feelings of amusement and disgust, and perspective moderated changes in affect and mixed feelings. Disgust increased equally in both conditions and amusement increased only in the observer condition. As a result mixed feelings of amusement and disgust were more intense in the observer condition. As the first study to demonstrate moderation of mixed feelings, this work adds to the extant literature on mixed feelings and has implications for emotion research.

One important issue in emotion research is the co-occurrence of different emotions (Diener, 1999; Oatley & Johnson-Laird, 1987; Reisenzein, 1995; Schimmack & Reisenzein, 1997). The co-occurrence of positive and negative emotions is particularly important because it addresses the valence structure of emotional experiences. If positive and negative emotions are mutually exclusive, a single bipolar valence dimension would suffice (Russell & Carroll, 1999). Alternatively, if people can experience positive and negative

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emotions simultaneously, then positive and negative feelings are best characterised as two distinct qualities of affects that at times mix (Diener & Iran-Nejad, 1986; Larsen, McGraw, & Cacioppo, 2001; Schimmack, 2001).

### Mixed feelings

Experiences of two affects of opposite valence such as pleasure and displeasure or love and hate are typically called *mixed feelings* (Beebe-Center, 1932; Schimmack, 2001). At times, researchers also use the term mixed feelings to describe concurrent experiences of two emotions of the same valence (e.g., fear and disgust). In the present article, we use the term *mixed feelings* in the narrow sense of concurrent experiences of a positive and a negative emotion that preserve the quality of the two emotions as opposed to creating an entirely new quality.

Although lay people believe that conflicting situations typically elicit mixed feelings (Harter & Buddin, 1987), scientific evidence for the existence of mixed feelings is scarce (Beebe-Center, 1932; Diener & Iran-Nejad, 1986; Larsen et al., 2001; Schimmack, 2001; Schimmack & Colcombe, in press). Moreover, much of this limited extant research suffers from two methodological limitations. First, most studies have relied exclusively on the Pearson correlation coefficient to test the relation between emotions. This statistic in isolation is inappropriate for this purpose because it fails to accurately represent the occurrence of mixed feelings (cf. Diener & Iran-Nejad, 1986; Larsen et al., 2001; Schimmack, 2001). For instance, correlations can be close to zero because participants experience neither of two emotions rather than experiencing both emotions concurrently. Second, most structural analyses have assessed emotions in neutral situations. It is impossible to make inferences about mixed feeling in these situations because most people do not experience much emotion in neutral situations. To examine co-occurrence of two emotions, it is critical to expose participants to a situation that may elicit multiple emotions. For example, Schimmack (2001) found that most participants felt pleasant and not unpleasant before an experiment, but felt both pleasant and unpleasant after a mild negative mood induction. Larsen et al. (2001) also found few incidences of mixed feelings of happiness and sadness in mundane situations. In these situations, most people felt happy and not sad. However, in ambivalent situations (e.g., after a happy–sad movie, at graduation) many participants reported mixed feelings of happiness and sadness.

In sum, despite a large literature of structural analyses of emotions there exists hardly any scientific evidence about the prevalence of mixed feelings because most structural analyses used Pearson correlations and assessed emotions in unspecified, neutral situations. The present article adds to the

few studies that have started to address this issue using experimental methods (Larsen et al., 2001; Schimmack, 2001). In particular, we wanted to know whether disgusting humour elicited mixed feelings of amusement and disgust and which cognitive factors would increase or decrease the intensity of mixed feelings. We choose disgusting humour as an interesting situation that has the potential to elicit disgust and amusement (Rozin, Haidt, & McCauley, 2000).

### Disgusting humour and mixed emotions

Despite the possibility of mixed feelings of disgust and amusement hardly anything is known about the relationship between these emotions. However, recent work suggests that at times these emotions function independently of one another. For instance, tasks designed to test disgust sensitivity (e.g., looking at, touching, or eating disgusting objects) are known to elicit strong experiences of disgust as well as frequent laughter (Rozin, personal communication, July 2001; Rozin, Haidt, McCauley, Dunlop, & Ashmore, 1999). In addition, Ventis, Higbee, and Murdock (2001) compared the effectiveness of non-humorous and humorous desensitisation techniques with spider-phobics (e.g., a spider saying, "So, who said these clowns can feel my legs"). Humorous stories elicited more amusement but were not more effective in reducing spider-phobia (i.e., disgust and fear of spiders). These findings suggest that amusement and disgust are rather independent emotions that do not mutually inhibit each other, and may at times even co-occur (i.e., mix).

Moreover, cognitive factors may at times put these emotions in conflict with each other and as a result influence the degree of mixing. One likely candidate is the perspective that a perceiver takes when viewing disgusting humour. Observers are more likely to interpret a disgusting situation as funny than are protagonists. For example, it is clearly more amusing when somebody else steps into dog faeces than when you do so yourself. One reason for this difference is that protagonists focus on the immediate consequences of a negative event for their own wellbeing, which may interfere with the cognitions that elicit amusement. Thus more amusement should be elicited when the same disgusting humorous scene is viewed from the perspective of an observer than from the perspective of a protagonist. It is less clear whether perspective would influence the experience of disgust. Disgust could be more intense from a protagonist's perspective because the protagonist would be in more immediate contact with the disgusting object. However, disgust is also easily elicited in mere observers, and objects known to be non-disgusting (e.g., peanut butter in the shape of dog faeces) and mere pictures of disgusting objects still elicit strong feelings of disgust (Lang, Greenwald, Bradley, & Hamm, 1993;

Rozin & Fallon, 1987). This suggests that disgust should be less dependent on cognitive factors such as alternative perspectives (Rozin & Fallon, 1987).

### Study overview and predictions

The purpose of the current study was to examine the impact of disgusting humour and perspective taking on mixed feelings of amusement and disgust. Participants watched a disgusting humorous clip from the movie *Pink Flamingos* (Waters, 1973), in which a female impersonator eats dog faeces. Participants were instructed to watch this clip from either the perspective of the Protagonist (i.e., the female impersonator) or an uninvolved, Outside observer. This clip was chosen from Gross and Levenson's (1995) list of movie clips because its ratings (on a 0–8 scale) of disgust (6.45) and amusement (2.45) suggest that it has potential to elicit mixed feelings. However participants made retrospective ratings of their feelings during the clip, making it possible that they experienced amusement at some times and disgust at other times, but never felt mixed feelings. Additionally, because these ratings represent averages across participants it is possible that some participants responded with amusement without disgust, whereas others were disgusted but not amused. To address these issues, in this study participants reported their current affect following the emotional video and we determined the intensity of mixed feelings for each individual before aggregating across participants (cf. Larsen et al., 2001; Schimmack, 2001).

We expected that the clip would elicit more amusement when viewed from the perspective of an outside observer than a protagonist, and as a result mixed feelings were predicted to be higher in the Outsider condition. We also expected that disgust would be strongly evoked in both conditions but were uncertain as to whether it would be reduced in the Outsider condition.

## METHOD

### Participants

Participants were students in a general psychology course at a large, public university in the Midwest United States ( $N=102$ , Males=45), average age=19.70 years,  $SD=4.39$  with 86% freshmen or sophomores. All participants received course credit.

### Materials

*Disgusting–humorous clip.* The 2-minute disgusting–humorous clip included a scene from the movie *Pink Flamingos* (Waters, 1973) in which

the main character (a female impersonator) eats dog faeces in a humorous manner (see Gross & Levenson, 1995).

## Questionnaires

*Demographics.* Three items assessed participants' age, gender, and year in college.

*Affect.* Affect was assessed with the items *disgusted* and *amused*. The items were presented in a list with four additional negative items (angry, guilty, scared, sad), and four additional positive items (contented, happy, relieved, excited) to disguise our primary interest in amusement and disgust. Immediately *after* watching the clip participants rated how intensely they felt each emotion "Right now at the present moment". This instruction was used to assess mixed feelings at one moment in time. Ratings were made on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*).

## Procedure

Groups of 10–15 participants came to the lab for a study on "Personality and Perspective Taking" and were randomly assigned to the Outsider ( $n = 53$ ) or Protagonist ( $n = 49$ ) perspective-taking condition. Perspective taking was defined as "the ability to mentally put yourself in another situation, and to feel the feelings and think the thoughts you would if actually experiencing that situation", and the experimenter explained that participation involved perspective taking for and reporting responses to situations presented through a videotape. Participants completed a consent form, the affect questionnaire (pre-clip) and several questionnaires not relevant for this study. Participants then watched the clip and completed the affect questionnaire again (post-clip). Just before they watched the clip participants in the Outsider condition were read the following instructions:

As you watch we want you to take the perspective of an outside observer to this situation. Imagine you have no connection to what is happening and that what is happening cannot impact you in any way. You are simply observing and reacting to the events as they unfold.

The following instructions were read in the Protagonist condition:

As you watch we want you to take the perspective of the protagonist or main actor in the clip. Imagine that you are this main character doing, thinking and feeling what this character does. Put yourself in the frame of mind so that you are responding as you would if it was actually you experiencing the situation as the main character.

## RESULTS

## Amusement

It was predicted that amusement would be higher after the clip in the Outsider than in the Protagonist condition. To test this prediction an Analysis of Variance (ANOVA) with Time (pre-clip vs. post-clip) as a within-subject variable and Condition (Outsider vs. Protagonist) as a between-subject variable was conducted. Results revealed the expected interaction,  $F(1, 100) = 5.72, p < .03$ , and follow-up analyses showed that amusement was higher in the Outsider than in the Protagonist condition after seeing the clip,  $t(101) = 3.08, p < .008$ , but not before seeing the clip,  $t(101) < 1$  (see Table 1). Paired  $t$ -tests further revealed that amusement significantly increased from before to after the clip in the Outsider condition,  $t(52) = 2.15, p < .03$ , but not in the Protagonist condition,  $t(48) = 1.18, p < .24$  (see Table 1).

## Disgust

It was predicted that disgust would be strong in both conditions following the clip. To test this prediction we conducted an ANOVA with Time (pre-clip vs. post-clip) and Condition (Outsider vs. Protagonist). Results revealed a main effect of time,  $F(1, 100) = 385.34, p < .0001$ , with disgust increasing from pre-clip to post-clip (see Table 1). No interaction emerged,  $F(1, 100) = 1.67, p < .20$ , indicating that the increase in disgust was equivalent across the two perspective-taking conditions. Additionally, disgust did not differ across conditions before or after seeing the clip,  $t(101) = 0.99$  and  $1.59, ps > .11$  (see Table 1).

TABLE 1  
Disgust, amusement, and mixed feelings before and after the disgusting humorous clip

	<i>Outsider perspective (n = 53)</i>				<i>Protagonist perspective (n = 49)</i>			
	<i>Pre-clip</i>		<i>Post-clip</i>		<i>Pre-clip</i>		<i>Post-clip</i>	
<i>Emotion (range 0–4)</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Amusement	.91 <sub>a</sub>	.93	1.38 <sub>b</sub>	1.26	.92 <sub>a</sub>	.98	.71 <sub>a,c</sub>	.94
Disgust	.17 <sub>a</sub>	.64	2.93 <sub>b</sub>	1.38	.14 <sub>a</sub>	.68	3.29 <sub>b</sub>	.84
Mixed feelings	.06 <sub>a</sub>	.46	1.11 <sub>b</sub>	1.39	.06 <sub>a</sub>	.26	.67 <sub>c</sub>	.29

Note: In each row means with differing subscripts differ at least  $p < .05$  (see text).

## Mixed feelings

The previous analyses revealed that both amusement and disgust increased in the Outsider condition. This finding suggests that participants in this condition felt both amused and disgusted. However, the mean increases are inconclusive because some participants may have felt amused but not disgusted while others may have felt disgusted but not amused with none of the participants simultaneously experiencing both emotions. To test the prediction that mixed feelings of amusement and disgust would be higher in the Outsider condition, we derived a measure of mixed feelings based on the MIN statistic (Kaplan, 1972; Priester & Petty, 1996; Schimmack, 2001). MIN is computed as the minimum of the intensity of two affects, i.e.,  $I[MF] = \min[I[\text{disgust}], I[\text{amusement}]]$ . In the current studies MIN assumes the lowest intensity (0) when amusement or disgust received the lowest rating. Values greater than 0 indicate that participants reported both amusement and disgust as present, and as  $I[MF]$  increases so does the amount of mixed feelings (i.e., the strength of the least intense affect increases).

$I[MF]$  values were subjected to an ANOVA with Time (pre-clip vs. post-clip) as a within-subject variable and Condition (Outsider vs. Protagonist) as a between-subject variable. This ANOVA revealed the expected interaction,  $F(1, 100) = 4.47, p < .04$ . As shown in Table 1 follow-up analyses revealed that the two conditions did not differ in the intensity of mixed disgust and amusement before the clip,  $t(101) < 1$ , but did differ after the clip with those in the Outsider condition reporting more mixed feelings,  $t(101) = 2.08, p < .04$ . A main effect of time was also found,  $F(1, 100) = 63.05, p < .0001$ , with mixed feelings increasing from pre-clip to post-clip in both the Protagonist condition,  $t(48) = 4.60, p < .0001$ , and Outsider condition,  $t(52) = 6.59, p < .0001$  (see Table 1). Hence, even the protagonist perspective elicited some mixed feelings, but, as predicted, mixed feelings were more intense in the observer condition.

To provide further insights into the co-occurrence of disgust and amusement, we also present plots of the bivariate frequency distribution of the two emotions (Larsen et al., 2001; Russell & Carroll, 1999; Schimmack, 2001). In these plots, responses that indicate the absence of amusement or disgust form an L-shape pattern, which is represented by the dark bars in Figure 1.

As long as actual responses fall onto the L-shape pattern, amusement and disgust can be considered mutually exclusive. However, responses outside the L-shape pattern, which are represented by the light bars in Figure 1, indicate experiences of mixed feelings. As shown in Figure 1, an L-shaped pattern clearly emerged for both conditions before the disgusting humour clip, which changed following the clip for both conditions although in different

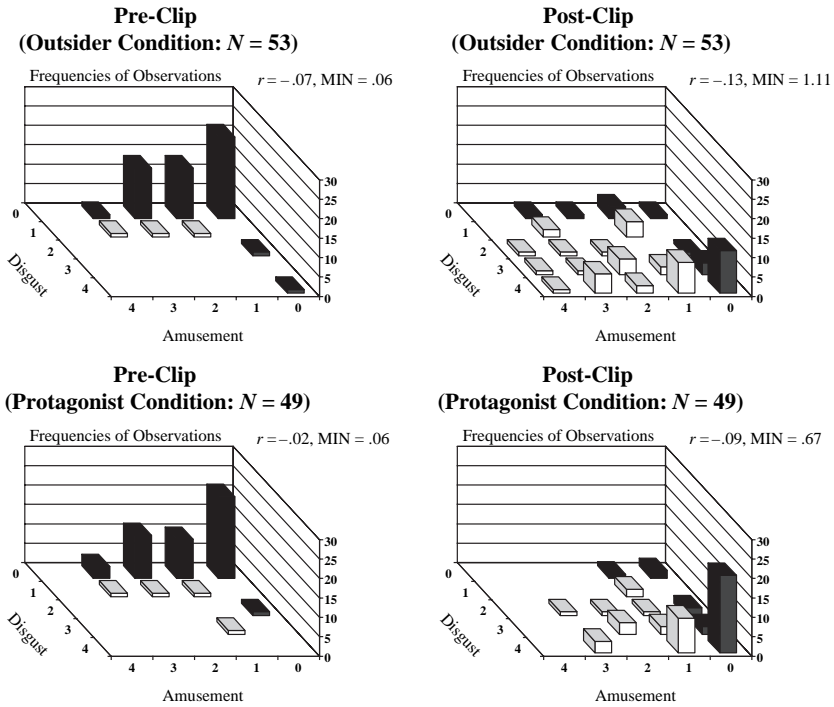


Figure 1. Contingency tables of disgust and amusement ratings.

directions. In the Protagonist condition there is movement toward low amusement and high disgust, as seen by the cluster of scores in the bottom right corner of the graph (see Figure 1). In the Outsider condition, more reports show concurrent experiences of intense disgust and amusement, as seen by the greater scattering of scores in the bottom left of the graph. This pattern is reflected in the higher MIN values in this condition.

### Relation between disgust and amusement

Finally, we also explored the Pearson correlations between disgust and amusement in the two perspective conditions. While by themselves correlations are not useful for assessing mixed feelings, they are useful in examining the (linear) relation between intensities of two emotions and together with MIN analyses may help to elucidate the nature of mixed feelings. As shown in Figure 1, all correlations were close to zero ranging from  $-.02$  to  $-.13$ ,  $p > .35$ . Before the clip correlations close to zero emerged because most participants reported neither amusement nor disgust. These findings show the problem of previous structural analyses that have relied exclusively on

zero correlations to argue that two emotions vary independently. In neutral situations, Pearson correlation can be close to zero because most participants experience neither of the two emotions rather than experiencing both concurrently. The correlation between amusement and disgust after the clip in the Outsider condition, however, reveals that the intensities of disgust and amusement vary independently even in a situation that elicits both emotions. Thus while in isolation correlations may misrepresent the nature of mixed feelings, in light of the present MIN findings the near-zero correlation in the Outsider condition provides further evidence of the independence of amusement and disgust.

## DISCUSSION

A small but growing body of evidence has revealed that people can experience feelings of opposite valence during the same situation (Larsen et al., 2001; Schimmack, 2001). The current research extends this literature to two previously unexplored emotions: amusement and disgust. Results revealed that disgusting humour elicited mixed feelings of disgust and amusement, and that taking an outsider's perspective enhanced amusement and mixed feelings more than taking the perspective of a protagonist. We also found that in a situation that elicited both emotions, the intensity of disgust varied independently of the intensity of amusement. These results complement findings on mixed feelings of pleasure and displeasure (Schimmack, 2001), which typically shows a reciprocal relation between intensities of pleasant and unpleasant emotions. The present study demonstrates that this reciprocal relation is not universal across all emotions (see also Larsen et al., 2001).

The most important contributions of this study are that it provides the first experimental evidence for mixed feelings of amusement and disgust and for the moderation of mixed feelings. It seems clear that the relationship between oppositely valenced affects depends heavily on the situation in which the affect is assessed (Larsen et al., 2001; Schimmack, 2001) and on various cognitive processes. For these reasons, structural analyses of emotion need to take into account the situational and cognitive processes that elicit emotions because these processes ultimately determine the observed structural relations between emotions. The present article takes this new viewpoint and demonstrated that the co-occurrence of disgust and amusement was influenced by situational and cognitive factors. First, in neutral situations without a proper stimulus, most participants reported no disgust and no amusement. This finding is consistent with the idea that most emotions are elicited by appraisals of emotional events. Second, we found that a disgusting humorous clip elicited mixed feelings of disgust and

amusement, and that the perspective of the observer influenced the intensity of those reactions. After taking the perspective of the protagonist, participants felt less amused after the disgusting humorous clip than they did after taking an outsider's perspective, producing less intense mixed feelings in these participants.

This pattern of results demonstrates that amusement and disgust are separate emotions that can be elicited individually and concurrently. In contrast, Schimmack (2001) found a negative association between displeasure and pleasure after a negative mood induction. One explanation for these differences could be the object of the emotions (Reisenzein & Schönplflug, 1992). Many emotional processes depend on the focus of attention and an object in the focus of attention likely has a stronger impact on emotional reactions. Furthermore, mixed feelings can be elicited by the same object or by different objects (Harter & Buddin, 1987). We speculate that independent activation occurs when two emotions are elicited by the same object. For example, in our study participants were disgusted and amused by somebody eating faeces, but in Schimmack's (2001) study pleasure was a background mood state, whereas displeasure was caused by presentations of negative pictures. Thus we would predict a negative relation between amusement and disgust if an amusing cartoon were presented next to a disgusting picture, because different objects would elicit amusement and disgust in this situation. Future research needs to examine such possibilities.

### Limitations and future directions

Future research also needs to examine the generalisability of our findings to other examples of disgusting humour, especially ones that are less disgusting. In particular, it would be interesting to examine why amusement but not disgust was influenced by our experimental manipulations of perspective. Three explanations are possible. First, disgust could be a more primitive emotional response that is more directly elicited by disgusting stimuli, whereas amusement requires a particular cognitive mindset to be elicited. Second, any negative emotion may be less sensitive to cognitive manipulations because of the automatic salience of negative stimuli. Third, it is possible that disgust was less sensitive to the manipulations used here because it was the dominant emotion in the clip (cf. Schimmack & Hartmann, 1997). Examining these possibilities is an important avenue for future research.

We used self-report measures of emotion, which have their limitations and may be subject to various demand characteristics. For instance, participants may have reported non-zero values of disgust and amusement in an attempt to summarise their emotional experiences during the video, despite the fact that they never concurrently experienced both emotions (e.g., participants

may have rapidly alternated between the two emotions). Thus it would also be informative to obtain additional measures of ongoing affective reactions such as facial expressions. Disgust and amusement are good candidates for the measurement of facial expressions because both emotions are associated with distinct facial expressions (Rozin, Lowery, & Ebert, 1994; Ruch, 1995). However, facial expressions cannot fully replace self-report measures because emotions can be experienced without visible facial expressions (Reisenzein, 2000). Therefore, a multi-modal assessment of emotions with self-reports and facial EMG would strengthen the evidence for mixed feelings in response to disgusting humour.

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