

Intergroup Emotional Exchange: Ingroup Guilt and Outgroup Anger Increase Resource
Allocation in Trust Games

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Abstract

Intergroup exchanges are an integral part of social life but are compromised when one group pursues its interests at another group's expense. The present research investigates whether expressing emotion can mitigate the negative consequences of such actions. We examine how emotions communicated by either an ingroup or outgroup member following an ingroup member's breach of trust affect other ingroup members' feelings of guilt and pride, and subsequent allocation of resources. In both studies, groups of participants played a two-round trust game with another group. In round one, they observed a member of their own group failing to reciprocate a trusting move by the outgroup. In Study 1 ($N = 85$), an *outgroup* member then communicated anger or disappointment, whereas in Study 2 ($N = 164$), an *ingroup* member then communicated happiness or guilt. Comparisons with no-emotion control conditions revealed that expressions of outgroup anger and ingroup guilt increased participants' allocations to an outgroup member in round two. The effect of an outgroup member's anger expression was mediated by participants' diminished feelings of pride about the ingroup action, whereas the effect of an ingroup member's guilt expression was mediated by participants' own feelings of guilt. Taken together, these findings support a social appraisal approach and highlight the roles that pride and guilt can play in shaping intergroup resource allocations.

Keywords: *intergroup emotion, guilt, pride, resource allocation, appraisal*

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People are connected to others through a multitude of relationships which often involve exchanges of money, services, or other valuable resources. These transactions can take place between individuals, but also between groups – including companies, institutions, and countries. Justice, fairness, and trust play an essential role in such exchanges. In the 18th century, Adam Smith was one of the first economists to highlight their importance in his influential *Theory of Moral Sentiments* (1790/2005). A large body of contemporary research corroborates his classic account. Fairness and trust – defined as the willingness to make oneself vulnerable based on the belief that others can be relied upon – are critical factors in economic exchanges (Güth, Ockenfels, & Wendel, 1993; Rabin, 1993; Rotter, 1967), and are associated with personal and societal well-being (DeNeve & Cooper, 1998; Fukuyama, 1996). The current research focuses on intergroup trust, which is harder to establish and easier to damage than trust between individuals (Ferrin, Bligh, & Kohles, 2007; Insko & Schopler, 1987; Polzer, 1996). Specifically, we study the consequences of one group failing to reciprocate another group's trust and examine whether subsequent intergroup exchanges are influenced by emotion communication.

Restoring Intergroup Trust

Despite the positive outcomes of trust, and despite people's strong propensity for cooperation and fairness (e.g., Gintis, 2000; Hamlin, Wynn, Bloom, & Mahajan, 2011), humans are also motivated to pursue their own selfish interests at the expense of other individuals or the interests of their own group at the expense of other groups. People systematically underestimate the severity of social as well as physical pain experienced by others (e.g., Nordgren, Banas, & MacDonald, 2011), and the greater the social distance from

these others, the more likely people are to cheat, steal money, exploit others, or sell faulty goods (e.g., Hoffman, McCabe & Smith, 1996).

Such selfish transactions have a negative impact on subsequent exchanges (Fehr & Fischbacher, 2004). They are, however, especially damaging in intergroup settings, because such contexts tend to elicit stronger competitive tendencies than do relations between individuals (Folmer, Klapwijk, De Cremer, & Van Lange, 2012; Wildschut, Pinter, Vevea, Insko, & Schopler, 2003). People also expect competitive behavior in intergroup contexts, making it difficult to establish and restore trust (Insko et al., 1993). Accordingly, extant research documents the limited effectiveness of intergroup apologies (Hornsey & Wohl, 2013; Nadler & Liviatan, 2006). Even if only one person causes harm, members of the victim group can still hold other members of the transgressor's group responsible, because they perceive the perpetrating group as an entity rather than a collection of separate individuals (Insko et al., 1988). As a consequence, violations committed by one group member may lead to retaliatory behavior (a common response to unfairness, e.g., Bosman & van Winden, 2002; Brebels, De Cremer, & Sedikides, 2008) directed towards other members of the group, thus escalating intergroup conflict.

An important question is whether and how cooperation between groups can be improved following such transgressions. The most straightforward method involves enacting less negative outgroup-directed behavior in future intergroup transactions, or even actively offering reparation for the harm done. Empirical evidence suggests that reparations help to reestablish cooperation after transgressions (Bottom, Gibson, Daniels, & Murnighan, 2002; De Cremer, 2010; Desmet, De Cremer, & Van Dijk, 2011). Individuals compensate for their own misdeeds in interpersonal settings (Berscheid & Walster, 1967; Regan, Williams, & Sparling, 1972), and may also do so if they feel responsible for transgressions committed by their group. Indeed, studies using intergroup contexts show that witnessing transgressions or

defections committed by ingroup members can motivate observers to compensate or make amends, especially if they identify with their group (Arora, Logg, & Larrick, 2015) or are observed by outgroup members (Gino, Gu, & Zhong, 2009). Such behaviors – as well as most economic decisions in mixed-motive situations – are typically embedded in a broader context and are therefore accompanied by other social signals.

Emotional Influences on Resource Allocation

Arguably, expressions of emotions accompanying resource-allocation decisions are among the most important of these signals because they convey information about the extent to which a given behavior is consistent with the allocator's or receiver's goals (Manstead & Fischer, 2001; Ortony, Clore, & Collins, 1988). For example, observing a person express regret after making an unfair allocation in a computer game increases the likelihood of participants making a fair offer themselves (van der Schalk, Kuppens, Bruder, & Manstead, 2015). Similarly, people cooperate significantly more with individuals who express guilt or regret after unfair behavior in economic games (de Melo, Carnevale, Read, & Gratch, 2014; Shore & Parkinson, 2017). These findings belong to a larger body of evidence demonstrating that emotions communicated in the context of economic exchanges shape receivers' subsequent behaviors (e.g., DeSteno, Bartlett, Baumann, Williams, & Dickens, 2010; Moretti & di Pellegrino, 2010; Schwarz, 2000; van Kleef, de Dreu & Manstead, 2010; Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008).

But how do communicated emotions affect economic decisions? According to social appraisal accounts, people's behaviors are guided not only by their own feelings and evaluations of a given situation but also by the ways in which other people appraise the same situation and react to it emotionally (Manstead & Fischer, 2001). Indeed, research documents that emotions displayed by an interaction partner influence observers' event appraisals and emotions (e.g. de Melo et al., 2014; Parkinson & Simons, 2009). In mixed-motive situations

people may even engage in reverse appraisals, inferring the motives and intentions of a social partner from their facial expressions, and using these inferences to guide their own behavior (de Melo et al., 2014). Knowing how a social partner appraises a situation provides a strong foundation for predicting their likely actions (Schelling, 1960). However, emotions can also convey corresponding appraisals implicitly and affect perceivers' behavior without the need for sophisticated reasoning about their meaning (e.g. Parkinson, Phiri, & Simons, 2012; Parkinson, 2011; Sorce, Emde, Campos, & Klinnert, 1985).

Intergroup Emotions: The Role of Guilt and Pride

It is possible to extend the social appraisal approach beyond interpersonal contexts to group processes, leading to the prediction that emotions expressed in an intergroup interaction can shape group members' appraisals as well as their emotional reactions and subsequent behavior (Parkinson & Manstead, 2015). Consistent with this claim, studies examining intergroup relations, like the research in interpersonal contexts, indicate a central role for emotion (e.g., Harth, Kessler, & Leach, 2008; Harth, Leach, & Kessler, 2013; Lelieveld, Van Dijk, Van Beest, & Van Kleef, 2013; Maitner, Mackie, & Smith, 2007). Moreover, a growing body of evidence reveals that emotions can increase the effectiveness of intergroup apologies (Giner-Sorolla, Castano, Espinosa & Brown, 2008; Wohl, Hornsey, & Bennett, 2012) or mediate their influence on outcomes such as retribution and forgiveness (Leonard, Mackie, & Smith, 2011). In sum, intergroup emotions should influence both economic decisions and reactions to behavioral transgressions.

For example, Lelieveld and colleagues (2013) examined how disappointment communicated by the recipient in a bargaining game affects the allocator's emotions and behavior. When an ingroup recipient expressed disappointment, allocators felt more guilt and consequently sent more resources. However, when an outgroup recipient expressed disappointment, allocators felt less guilt and made lower offers. Similarly, a recent study

(Solak, Tagar, Cohen-Chen, Saguy, & Halperin, 2016) showed that outgroup disappointment increased participants' willingness to engage in collective action protecting that outgroup. However, this effect was only observed when participants perceived the situation as illegitimate. Such findings demonstrate that emotions are embedded in broader relational contexts and that their consequences cannot be fully understood without reference to the surrounding situation (Harth et al., 2008; Leach, 2016).

People may express emotions about the specific behavioral choices of ingroup and outgroup members as well as the outcomes they experience. Guilt and pride are especially important in the context of intergroup transgressions, because they imply contrasting reactions to the group-serving behavior of an ingroup member (Harth et al., 2008; Harth et al., 2013; Maitner et al., 2007). Focusing on benefits to the ingroup may lead group members to experience pride (Martens, Tracy, & Shariff, 2012), but focusing on the harm done to the outgroup and on the violation of moral standards may lead members to experience guilt (e.g., Baumeister, Stillwell, & Heatherton, 1994; Doosje, Branscombe, Spears, & Manstead, 1998). Correspondingly, pride or happiness expressed by an ingroup member may lead other group members to focus on benefits for the ingroup and consequently experience pride themselves, whereas guilt expressed by an ingroup member may lead other group members to focus on harm to the outgroup and consequently also to experience guilt.

These emotions are also associated with different behavioral outcomes: Pride predicts increased perceptions of the legitimacy of the behavior (Harth et al., 2008) and a greater likelihood of engaging in the same actions (Tangney, Stuewig, & Mashek, 2007; van der Schalk, Bruder, & Manstead, 2012); guilt, on the other hand, has been linked with inhibition of ongoing behavior, and self-reflection (Amodio, Devine, & Harmon-Jones, 2007), as well as reparatory gestures and behaviors (Baumeister et al., 1994; Brown, Gonzalez, Zagefka, Manzi, & Cehajic, 2008; Tangney & Dearing, 2003). Group-based pride and guilt should

therefore predict behaviors following a transgression committed by the ingroup. Consistent with this reasoning, Harth and colleagues (2013) showed that being informed about the ingroup's responsibility for protecting or damaging the environment influenced participants' anger, pride, and guilt, which in turn affected behavioral intentions to repair the damage or punish the wrongdoer. Maitner et al. (2007) obtained similar effects of presenting participants with emotion-inducing statements describing their country's aggressive actions. The degree to which these descriptions elicited satisfaction or guilt predicted opposing behavioral intentions: to increase or decrease support for future aggression, respectively.

In sum, research suggests that emotions communicated in intergroup interactions predict behavioral intentions to allocate resources. This influence is likely to operate through the elicitation of emotions in receivers. In particular, guilt and pride following unfair behaviors may have significant and contrasting consequences for intergroup exchanges.

The Present Research

The present research focuses on resource allocation in competitive exchanges between groups – specifically, after a member of one's own group fails to reciprocate another group's trust, leading to a sizeable inequality in the two groups' resources. We investigate how emotions expressed in response to such group-serving behavior affect other group members' pride and guilt as well as their subsequent resource allocation decisions. We examine these effects for emotions expressed by outgroup members (Study 1) and by ingroup members (Study 2). We propose that both ingroup and outgroup emotional responses to ingroup-serving behavior will affect how other group members feel and consequently act. In accord with social appraisal accounts, negative emotions – such as anger or disappointment – expressed by the victim outgroup, and signaling the negative impact of the trust violation, should influence ingroup members' evaluations of how the group has behaved and their willingness to reduce the inequality between groups. Correspondingly, emotions expressed by

ingroup members – such as happiness or guilt – are likely to emphasize either the ingroup's superiority or the costs imposed on the outgroup by this behavior.

We therefore examine how ingroup members' pride and guilt are affected by anger and disappointment expressed by an outgroup member (Study 1) and by happiness and guilt expressed by the ingroup perpetrator (Study 2). We focus on these emotions because of their relevance in resource allocation (e.g., Bosman & van Winden, 2002; Lelieveld et al., 2013; Maitner et al., 2007; Solak et al., 2016; van Kleef, de Dreu, & Manstead, 2004; van Kleef, de Dreu, & Manstead, 2006) and because their consequences appear to vary depending on whether the person expressing them is an ingroup or outgroup member (e.g., Lelieveld et al., 2013).

We hypothesize that emotional reactions to an ingroup member's selfish behavior communicated by an ingroup or outgroup member will affect other group members' subsequent allocations. We also hypothesize that this effect will be mediated by changes in group members' feelings of guilt and pride. Specifically, emotion expressions that elicit lower levels of pride and higher levels of guilt in ingroup members should lead them to share more resources in subsequent intergroup interactions, thereby softening the negative impact of the prior breach of trust.

To test these predictions, we conducted two laboratory experiments using an interactive trust game (Berg, Dickhaut, & McCabe, 1995) adapted for an intergroup context. Within the game, we manipulated the emotions expressed by a representative of either the outgroup (Study 1) or the ingroup (Study 2), following an unfair exchange benefitting the ingroup in a competitive intergroup setting (Benton & Druckman, 1974; Folmer et al., 2012). To examine how emotional experience was affected by ingroup and outgroup expressions, we measured perceivers' feelings of pride and guilt before asking them to play a second round of the game with another member of the outgroup. We then examined how resource allocations

in this second round varied as a function of ingroup and outgroup members' reactions to unfairness and participants' own feelings of pride and guilt.

Study 1

Study 1 focused on the impact of an outgroup member's emotional reaction to an ingroup member's trust-violating behavior. In particular, we investigated how the communication of anger or disappointment affected participants' pride and guilt as well as their subsequent resource allocation to an outgroup member. Both anger and disappointment are plausible reactions to unfairness (Keltner, Ellsworth, & Edwards, 1993; Lelieveld et al., 2013) but elicit contrasting reactions and perceptions. Disappointment – like sadness – is a help-seeking emotion that elicits sympathy but may also convey weakness and dependency (Keltner & Kring, 1998; Lelieveld et al., 2013). Its effects may differ depending on the emotion it elicits in the receiver: If communicated disappointment elicits guilt, subsequent behavior is likely to be prosocial; if it does not elicit guilt, more selfish behavior is likely to follow (Lelieveld et al., 2013).

Unlike disappointment, anger conveys toughness and high limits in negotiations and economic exchanges, often leading to better outcomes for the expresser than other emotions such as happiness or disappointment (Lelieveld et al., 2013; Van Kleef et al., 2004). It indicates that goals have been hindered and that the expresser blames someone else for it (Smith, Haynes, Lazarus, & Pope, 1993). Research on group-based anger (de Vos, van Zomeren, Gordijn, & Postmes, 2013) suggests that this emotion may also improve intergroup outcomes by communicating the importance of the relationship between groups and decreasing destructive conflict intentions. Moreover, as with disappointment, existing literature suggests that the effects of anger depend on the emotional reaction it elicits in the receiver (e.g., Lelieveld, Van Dijk, Van Beest, & Van Kleef, 2012).

Because both disappointment and anger can lead to positive social outcomes and because the social effects of these two emotions appear to depend on the feelings they evoke in receivers, we hypothesized that resource allocations to the outgroup would differ depending on the extent to which participants responded to the outgroup's disappointment and anger with pride or guilt. Consistent with previous research (Lelieveld et al., 2013), we predicted that outgroup disappointment would increase allocations only to the extent that it induced guilt in participants. Conversely, since outgroup anger signals norm violation (de Vos et al., 2013) and may constitute a threat to the common resource pool (Bosman & van Winden, 2002), it should reduce participants' positive feelings about their group's competitive advantage without eliciting guilt. We therefore predicted that increases in guilt and decreases in pride should encourage higher allocations, with outgroup disappointment increasing guilt, and outgroup anger decreasing pride.

Method

Participants and design. Eighty-five participants (50 females, $M_{age} = 21.70$, $SD = 5.10$) were recruited in groups during lab sessions (for a total of 16 sessions over six weeks) and paid £5 for their time. The study received ethical approval from the Central University Research Ethics Committee at the University of Oxford (R47094/RE001). We recruited as many participants as we could and excluded data from 18 of them: ten who did not answer three questions checking the understanding of the trust game¹ and eight who did not complete the experiment due to a computer error (final $N = 67$). Statistical analyses were conducted only when data collection was completed, after the 16 planned lab sessions. The study used a between-subjects design, with three outgroup emotion conditions (anger: $n = 23$; disappointment: $n = 24$; control: $n = 20$).

Procedure. We implemented the study in Qualtrics (Provo, UT). Participants were recruited in groups of 4 to 10 and worked at separate computer stations in the same room.

After providing consent, they completed an association test (Doosje, Spears & Koomen, 1995) that ostensibly divided them into two groups by identifying inductive and deductive thinkers. The questionnaire asked participants to indicate which item (of the four provided) they most closely associated with each of 7 words and 7 numbers. Members of the two groups then played a trust game (Berg et al., 1995) to gain lottery tickets for their respective teams. The goal was to maximize the group's tickets thus increasing the chances of winning a lottery prize of £100. The trust game itself involved an 'investor' transferring lottery tickets to a 'trustee.' The number of tickets transferred was then tripled, and the trustee could theoretically return any proportion of this new total to the investor. Note that investors in trust games risk exploitation by trustees who are not compelled to repay; however, if investors transfer sufficient resources and trustees reciprocate, both parties end up better off than at the start of the game.

After reading the instructions, participants were informed that their team would act as trustees and that one member of their group would play a 'demonstration round' with someone from the other team (supposedly to help them learn the rules of the game). They then read a message stating that another member of their team had been selected to play and that that they would be shown what was happening on this person's screen during the demonstration round. After a short waiting time, ostensibly to establish a computer connection, participants watched what they believed was the real-time trust game but was in fact a pre-recorded screen capture.

The representatives of both teams started the game with an initial endowment of 10 lottery tickets, which could be increased or decreased depending on players' decisions. The video showed the ingroup representative receiving 7 tickets (then tripled to 21) and subsequently returning 0 tickets to the other team. After this breach of trust, the ingroup representative received a message from the other player, reporting how this person felt about

the round. The message stated either “I am angry about the round” (anger condition), or “I am disappointed about the round” (disappointment condition). In the control condition, the ingroup representative did not receive a message from the outgroup representative.

After observing the demonstration round, participants rated the extent to which they felt proud and guilty, using 7-point Likert scales running from 1 (*Not at all*) to 7 (*Extremely*). These items were presented along with five other items (interested, enthusiastic, upset, happy, and attentive; see also Supplementary Materials, Table S1), which served as fillers. Participants then played a second round of the game with another member of the outgroup team. In this round, they were informed that they had received 4 tickets (tripled to 12) from the outgroup player and were asked to decide how many of their resulting 22 tickets (10 initial tickets + 12 received from the other player) to return. The number of tickets sent to the outgroup member provided the main dependent measure of resource allocation.

After the second round, participants were asked to think back to the demonstration round and rate their responsibility for and feeling of guilt about the outcome, and how much they had wanted to compensate and make amends for it. They also rated how fairly the ingroup representative had behaved in the demonstration round, and how much they had in common with ingroup and outgroup members. To respond, participants made ratings on scales ranging from 1 (*Not at all, or Very little*) to 5 (*Very much*). Three items tested participants’ understanding of the trust game, and, in the anger and disappointment conditions, one open-ended question asked about the emotion communicated by the outgroup member. Finally, participants completed the Test of Self-Conscious Affect (TOSCA, Tangney, Wagner, & Gramzow, 1989) and the ‘slider’ measure of Social Value Orientation (Murphy, Ackermann, & Handgraaf, 2011). After finishing the questionnaire, they were thanked and debriefed. One of the 16 sessions was randomly selected and the 4 participants in this session shared the £100 lottery prize.

Results²

Manipulation checks. Participants rated the fairness of the ingroup representative as significantly lower than 3, the scale midpoint, $M = 1.53$, $SD = 1.01$, $t(66) = -11.81$, $p < .001$. These ratings did not vary as a function of outgroup emotion, $F(2, 63) = 2.13$, $p = .13$, $\eta^2_p = .06$.

Responses to the open-ended question asking about the emotion communicated by the outgroup member were coded as instances of anger (if they contained the word “anger” or “angry”) or as disappointment (if they contained the word “disappointment” or “disappointed”) by two independent judges (in complete agreement, all $\kappa_s = 1.00$, $ps < .001$). Two subsequent chi-square tests revealed that participants reported perceiving anger more frequently in the anger (78%) than in the disappointment condition (4.2%), $\chi^2(1, N = 47) = 26.77$, $p < .001$, and perceiving disappointment more frequently in the disappointment condition (79%) than in the anger condition (0%), $\chi^2(1, N = 47) = 30.56$, $p < .001$.

Resource allocation. Allocations in the second round were significantly affected by outgroup emotion, $F(2, 64) = 3.25$, $p = .045$, $\eta^2_p = .09$,³ showing that participants sent more tickets in the anger condition ($M = 6.17$, $SD = 2.92$) than in the control condition ($M = 3.70$, $SD = 3.96$), $p = .06$ (Tukey HSD), 95% CI [-5.01, .06]. The allocations made in the disappointment condition ($M = 4.12$, $SD = 3.49$) did not differ from those made in the control condition, $p = .91$, or from those made in the anger condition, $p = .11$.

Pride. Feelings of pride were also affected by outgroup emotion, $F(2, 64) = 3.31$, $p = .04$, $\eta^2_p = .09$, such that participants felt less pride in the anger condition ($M = 1.56$, $SD = 1.04$) than in the control condition ($M = 2.65$, $SD = 1.69$), $p = .04$, 95% CI [.04, 2.12]. The difference between the control and disappointment conditions ($M = 2.29$, $SD = 1.49$ and between the two emotion conditions were not significant ($p = .68$, $p = .19$, respectively).

We conducted an indirect effects analysis to investigate whether the effect of outgroup anger on resource allocation was mediated by diminished feelings of pride (Hayes, 2013).⁴ Outgroup anger (compared to the control condition) was a significant positive predictor of allocations, $B = 2.47$, $F(1,64) = 5.47$, $p = .02$, and a significant negative predictor of pride, $B = -1.08$, $F(1,64) = 6.24$, $p = .01$. When participants' allocations were regressed on outgroup anger and self-reported pride, the effect of diminished pride remained significant, $B = -0.87$, $F(1,63) = 9.19$, $p = .003$, 95% CI [-1.44, -.30], but the direct effect of outgroup anger was no longer significant, $B = 1.53$, $F(1,63) = 2.15$, $p = .15$, 95% CI [-.55, 3.62]. In addition, the indirect effect of outgroup anger through participants' diminished feelings of pride was significant, $B = .94$, 95% CI [.18, 2.25], estimated with 5000 bootstrap resamples.

Guilt and guilt-related appraisals. Participants' ratings of guilt were not influenced by outgroup emotion. Similarly, the guilt and guilt-related appraisal ratings (willingness to compensate and responsibility for the outcome of the first round) measured after the second-round allocation were not significantly affected by emotion condition, $F_s < 1$, *ns*.

Discussion

In this study, we investigated the effects of emotions expressed by an outgroup member on participants' own emotions and subsequent resource allocation. Following an ingroup member's selfish behavior, an outgroup member communicated anger, disappointment, or no emotion via a written message. Results revealed that participants sent more tickets when the outgroup member communicated anger than when no emotion was communicated. In other words, anger increased the level of resources shared with the outgroup. Further, the effect of anger on allocations was mediated by diminished feelings of pride, suggesting that participants' pride about the ingroup advantage decreased when the outgroup expressed anger. Outgroup anger did not affect participants' guilt or their feelings of responsibility for the behavior of the ingroup member. These results are consistent with

social appraisal accounts (e.g., Manstead & Fischer, 2001), suggesting that emotion and behavior in intergroup exchanges partly depend on the emotions expressed by members of the other group. In particular, outgroup anger appears to have reduced participants' positive orientation to the behavior of the ingroup trustee, resulting in diminished pride and higher reparation. Together with previous research investigating the role of anger in negotiations (e.g. van Kleef et al., 2004) and following intergroup transgressions (de Vos et al., 2013), our findings suggest that expressions of this emotion can lead to positive social outcomes and improve exchanges between groups following unfair behaviors. Specifically, after a failure to reciprocate trust, emotions expressed by an outgroup can increase the allocation of resources to the outgroup, which is in turn likely to help repair trust between the two groups. In accord with previous research, individuals may increase their allocations in order to soften the negative implications of transgressions by other ingroup members (Gino, Gu, & Zhong, 2009).

Interestingly, expressions of outgroup disappointment following the ingroup member's behavior did not increase guilt and did not affect participants' allocations. This is consistent with Lelieveld and colleagues' (2013) earlier finding that expressed disappointment only elicited cooperative behavior when it evoked guilt. In their research, guilt was only elicited when disappointment was communicated in individual (versus representative) negotiations or by an ingroup (versus outgroup) member. In the current study, disappointment was communicated by a single outgroup member to another supposed member of the ingroup and not directly to participants themselves. Thus, consistent with previous research (Lelieveld et al., 2012; Lelieveld et al., 2013), the absence of an effect on allocations in the disappointment condition is likely due to the fact that outgroup communication of this emotion did not increase participants' guilt. It should also be acknowledged that the sample size in this study was low due to logistical constraints, making

it possible that expressions of disappointment did not affect participants' allocations or feelings of guilt because of insufficient statistical power. Given that we determined in advance the testing schedule for data collection and did not analyze participants' responses until all sessions were completed, it is unlikely that the significant effects of anger are inflated (Kühberger, Fritz, & Scherndl, 2014). In sum, while the findings of Study 1 provide intriguing insights into the role of anger in intergroup settings, they deserve to be replicated in confirmatory research using a larger sample size.

The results of Study 1 show that emotions communicated following group-serving actions can influence subsequent intergroup exchanges. The emotion in this experiment was communicated by the outgroup, but there are good reasons for believing that the emotional reaction of the ingroup member who engaged in group-serving behavior should also affect resource allocation. Ingroup members' emotions – especially those expressed by the person who engaged in the unfair behavior – are likely to affect how participants feel and consequently act. For example, recent evidence reveals that positive or negative emotions displayed by someone who has acted unfairly influence observers' economic decisions by communicating how the expresser appraises the unfair act and by reinforcing (or undermining) social norms of cooperation and fairness (van der Schalk et al., 2015). These effects, observed in interpersonal settings, should also operate during interactions between groups. Therefore, Study 2 focused on the influence of emotions expressed by the transgressing ingroup member on subsequent resource allocation.

Study 2

Study 2 manipulated emotions expressed by the ingroup rather than the outgroup, and again investigated the mediation of their effects on participants' allocations by participants' own experiences of pride and guilt. We extended the methods used in Study 1 to create a more immersive paradigm to investigate participants' reactions in a similar trust-game

context. In this study, the ingroup member's group-serving behavior was enacted by a confederate, posing as another participant. The confederate was (apparently randomly) selected to play a 'demonstration round' of the trust game. In this round, she engaged in the same group-serving behavior as seen in Study 1. She then communicated verbal and nonverbal expressions of either guilt or happiness.

By expressing guilt, an ingroup member emphasizes the harm done to the outgroup and implicitly conveys a negative appraisal of their own behavior towards that outgroup. According to social appraisal accounts (e.g., Manstead & Fischer, 2001; Parkinson, 2011), this communication should affect how other ingroup members feel about the situation. Specifically, we predicted that guilt expressed by the ingroup representative would evoke guilt in participants and thereby increase cooperation (Baumeister et al., 2014). Van der Schalk and colleagues (2015) found that participants who observed another individual expressing regret about unfair resource allocation decisions expected to feel a similar emotion if they were to behave in the same way, thus encouraging greater fairness in their own resource allocation decisions. These findings suggest that regret about acting unfairly establishes a social norm of fairness and sharing. We predicted that expressions of guilt by the ingroup representative would have a similar effect, but only to the extent that they increased participants' own feelings of guilt.

The possible outcomes of expressing happiness following group-serving behavior are less clear-cut. The most straightforward prediction – in line with the findings of van der Schalk et al. (2015) – is that expressing happiness will serve to frame the intergroup exchange as competitive, one in which it is normative to act in a way that favors one's own group. In this case, expressed happiness should increase pride and decrease resource allocation. Indeed, expressions of happiness in relation to an action resulting in ingroup benefit may be interpreted by other group members as satisfaction or pride, potentially

increasing participants' support for the confederate's unfair behavior (e.g., Harth et al., 2013; Maitner et al., 2007). We therefore predict that the effects of the ingroup representative's happiness on allocation behavior will depend on the extent to which it elicits pride in participants.

In summary, Study 2 manipulated ingroup reactions to the same group-serving behavior enacted in Study 1 to investigate whether they would evoke pride or guilt in ingroup members and thereby influence allocations in subsequent exchanges with outgroup members. As in Study 1, we predicted that the influence of emotion expressions on participants' allocations would be mediated by participants' own feelings of pride and guilt. Emotion expressions eliciting lower pride and higher guilt should increase participants' allocations. Conversely, emotion expressions evoking greater pride and lower guilt should reduce allocations.

Method

Participants and design. The study was approved by the ethics committee of Cardiff University's School of Psychology (EC.14.10.14.3866). One hundred and sixty-four participants (139 females, $M_{age} = 18.43$, $SD = 0.82$) were recruited in groups of two or three persons (for a total of 60 sessions) and compensated with course credit. We recruited as many participants as we could during a 3-week period, aiming for at least 53 usable data points in each condition to ensure 80% statistical power to detect a medium-sized effect ($f = 0.25$) in a between-subjects ANOVA. We excluded data from 17 participants: three who did not follow experimental instructions, one who reported having participated in a similar experiment in the past, and 14 who did not correctly answer the three questions checking the understanding of the trust game (final $N = 147$). The study used a between-subjects design, where each group was randomly allocated to one of the three ingroup emotion conditions (guilt: $n = 53$; happiness: $n = 47$; control: $n = 47$).

Procedure. The procedure was similar to Study 1 but used a more immersive paradigm. Each 2- or 3-person group was accompanied by one of two female confederates who posed as a fellow participant.

Participants were first informed that they would be interacting with another group of students. The two groups had ostensibly been recruited on the basis of participants' scores on a prior survey. To reinforce the impression that participants were interacting with another team, the experimenter appeared to communicate by telephone with a colleague who was supervising the other group. After providing written consent, participants were left alone in the room for 10 minutes with the task of selecting a name for their group. This task served as an icebreaker designed to increase group cohesion.

As in Study 1, participants next played a 'demonstration round' in order to learn the rules of the game. The experiment was implemented in MediaLab (version 2012.4.133, New York, NY: Empirisoft Corporation). Participants gathered around the computer, which selected (supposedly at random) one representative from each of the two teams. In reality, the confederate was always selected as the ingroup representative. She sat at the computer and ensured that other group members standing behind her could read the trust game instructions on the screen. As in Study 1, the participant's team acted as trustees, while the other team acted as investors. After receiving 7 tickets (tripled to 21) from the outgroup member, the confederate decided not to return any tickets to the other team. In the guilt and happiness conditions, the program asked the confederate how guilty and happy she felt about the number of tickets returned to the other group. The confederate answered the question following a standardized script. In the guilt condition she sighed, looked down, and said "*Now I don't feel so good about it,*" before selecting the response *very much* for guilt and *a little* for happiness. In the happiness condition, she laughed, nodded her head, and said "*I feel pretty good about it,*" then selected the response *very much* for happiness, and *a little* for

guilt. In the control condition, the ingroup representative was not asked about how she felt and did not express any emotion.

Next, participants moved to another room and sat at separate workstations. There, they reported the extent to which they felt proud and guilty after the demonstration round, using 5-point scales ranging from 1 (*Not at all*) to 5 (*Extremely*) in a questionnaire that also included four filler items (interested, enthusiastic, upset, and attentive, see also Supplementary Materials, Table S2 for details). Participants then played the second round of the game with a member of the other group. As in Study 1, they were informed that they had received 4 tickets from this other person, and were asked how many of the resulting 22 tickets they wished to return.⁵

As manipulation checks, participants rated the fairness of the decision made by the ingroup representative and how happy and positive the representative had felt about it. Then, as measures of guilt and guilt-related appraisals, there followed items asking about the extent to which participants felt guilty about and responsible for the (unequal) outcome of the demonstration round, and how much they had wanted to compensate for it. Participants were also asked how much they thought they had in common with other members of their own team and with members of the other group. Finally, they answered three screening questions testing their understanding of the trust game and completed the TOSCA (Tangney et al., 1989). They were thanked and debriefed by e-mail. One lottery-winning team was randomly selected to share £100 between its members.

Results

Similar to Study 1, we examined how emotions expressed by the ingroup member (happiness, guilt, control) affected participants' feelings of pride and guilt and their behavior in the second round of the trust game.

Manipulation checks. Participants rated the fairness of the ingroup representative as significantly lower than 3, the scale midpoint, $M = 2.13$, $SD = 1.12$, $t(146) = -9.44$, $p < .001$. These ratings did not vary as a function of ingroup emotion, $F(2,144) = .44$, $p = .64$, $\eta^2_p < .01$.

Participants' ratings of the extent to which the ingroup representative was happy were significantly influenced by the emotion condition, $F(2,144) = 67.53$, $p < .001$, $\eta^2_p = .48$. Post-hoc comparisons using the Tukey HSD test revealed that happiness ratings were significantly lower in the guilt condition ($M = 2.23$, $SD = 0.97$) than in the control condition ($M = 3.83$, $SD = 0.89$), $p < .001$, 95% CI [1.18, 2.03]. However, the difference between the happiness condition ($M = 4.17$, $SD = 0.82$) and the control condition was not significant, $p = .16$.⁶

Resource allocation. Participants' allocations in the second round were significantly affected by ingroup emotion, $F(2,144) = 3.25$, $p = .04$, $\eta^2_p = .04$.⁷ Participants sent significantly more tickets in the guilt condition ($M = 4.02$, $SD = 2.73$) than in the control condition ($M = 2.77$, $SD = 2.19$), $p = .03$, 95% CI [.07, 2.43]. There were no significant differences between the happiness ($M = 3.26$, $SD = 2.47$) and control conditions, $p = .61$, or between the happiness and guilt conditions, $p = .28$.

Pride. Feelings of pride were marginally significantly influenced by ingroup emotion, $F(2,144) = 2.93$, $p = .06$, $\eta^2_p = .04$, such that participants were less proud in the guilt ($M = 1.72$, $SD = 0.84$) than in the control condition ($M = 2.19$, $SD = 1.30$), $p = .06$, 95% CI [-.01, .96]. The difference between the control and happiness conditions ($M = 1.81$, $SD = 0.90$) was not significant, $p = .17$, and nor was the difference between the two emotion conditions, $p = .90$.

Mediation analysis revealed that expressions of guilt by the ingroup representative (compared to the control condition) significantly increased participants' allocations, $B = 1.25$, $F(1,144) = 6.34$, $p = .01$, and significantly reduced their feelings of pride, $B = -0.47$, $F(1,144) = 5.34$, $p = .02$. There was a tendency for participants' diminished feelings of pride to predict

participants' allocations when controlling for emotion condition, $B = -.35$, $F(1,143) = 3.09$, $p = .08$, 95% CI $[-.75, .04]$. The direct effect of guilt emotion condition on participants' allocations remained significant in this joint regression model, $B = 1.09$, $F(1,143) = 4.66$, $p = .03$, 95% CI $[.09, 2.08]$. However, the indirect effect of condition through diminished pride was significant when estimated with 5000 bootstrap resamples, $B = .17$, 95% CI $[.001, .52]$, suggesting partial mediation.

Guilt and guilt-related appraisals. Feelings of guilt were significantly affected by ingroup emotion, $F(2,144) = 4.64$, $p = .01$, $\eta^2_p = .06$, such that participants felt more guilty in the guilt condition ($M = 2.91$, $SD = 1.23$) than in the control condition ($M = 2.21$, $SD = 1.02$), $p = .008$, 95% CI $[.15, 1.23]$. Neither the difference between control and happiness conditions ($M = 2.64$, $SD = 1.15$), $p = .17$, nor the difference between the two emotion conditions was significant, $p = .47$. Participants' ratings of guilt and guilt-related appraisals after second round allocations were not predicted by emotion condition, $F_s < 1.6$, *ns*.

Mediation analysis showed that expressions of guilt by the ingroup representative (compared to the control condition) significantly predicted participants' allocations, $B = 1.25$, $F(1,144) = 6.34$, $p = .01$, and their own feelings of guilt, $B = 0.69$, $F(1,144) = 9.20$, $p = .003$. Participants' guilt remained a significant predictor of their allocations in a joint regression model controlling for emotion condition, $B = 0.97$, $F(1,143) = 35.45$, $p < .001$, 95% CI $[.65, 1.29]$, but the effect of emotion condition on allocations was no longer significant, $B = .58$, $F(1,143) = 1.58$, $p = .21$, 95% CI $[-.33, 1.49]$. The indirect effect of condition through self-reported feelings of guilt was significant when estimated with 5000 bootstrap resamples, $B = .67$, 95% CI $[.26, 1.23]$, consistent with full mediation.

Discussion

In Study 2 we examined the effect of an ingroup member's expressed emotions on participants' pride, guilt, and allocation behavior. As predicted, the results indicated that guilt

expressed by an ingroup member who had engaged in group-serving behavior led participants to make higher allocations to an outgroup game partner in a subsequent round, compared to no emotion. The effect of guilt expression on allocations was fully mediated by participants' own experienced guilt. This pattern of findings is in line with social appraisal accounts (Manstead & Fischer, 2001). There was also evidence, albeit weaker, that the ingroup member's guilt expression reduced subjective pride about the ingroup's behavior and thereby increased allocations to the outgroup. This finding mirrors the results of Study 1, where lower levels of participants' pride also increased resource allocation to the outgroup.

There was no evidence that ingroup expression of happiness influenced pride, guilt, or participants' allocations. As noted earlier, previous research shows that seeing someone expressing positive emotion after an unfair behavior increases the likelihood of the observer acting unfairly (van der Schalk et al., 2015). We therefore expected that seeing the representative's happiness following a group-serving behavior would increase participants' pride, and decrease both guilt and resource allocation. It is possible that the initial low allocation of the ingroup representative in the demonstration round, combined with the intergroup setting (Folmer et al., 2012), established a particularly competitive social norm, leading to participants' low allocations in the control condition. The influence of happiness might therefore be stronger if the emotion expression followed a less extreme instance of unfair behavior. Alternatively, general fairness norms (Gintis, 2000; Hamlin et al., 2011) may have made it hard for participants to share the confederate's apparent happiness following trust-violating behavior. A third, possibly related explanation for the lack of effect in the happiness condition is that it failed to produce significantly higher perceptions of confederate happiness than the control condition. This suggests that future research will need to use stronger manipulations of happiness.

General Discussion

In two studies, we demonstrated the impact of communicated emotions on resource allocation in intergroup transactions. Emotions communicated by both outgroup (Study 1) and ingroup (Study 2) members following group-serving behavior by an ingroup member influenced the amount of resources that participants subsequently transferred to the outgroup. In Study 1, we showed that when an outgroup representative communicated anger, compared to no emotion, ingroup members experienced less pride, and subsequently made higher allocations to the outgroup. In Study 2, we found that when an ingroup representative expressed guilt, participants felt more guilty and less proud, and made higher allocations to the outgroup than when that ingroup representative expressed no emotion. Together, these findings highlight the importance of emotion expressions in intergroup relations and suggest a mechanism whereby these emotions can shape intergroup trust and behavior. Specifically, the results of our mediation analyses suggest that intergroup emotions affect intergroup resource allocation by reducing feelings of pride or increasing feelings of guilt in group members.

We focused on these emotions because they reflect opposing reactions to ingroup advantage (Hart et al., 2008, 2013; Maitner et al., 2007). This advantage can be framed as legitimate and therefore as a basis for increased pride (Tangney et al., 2007; van der Schalk et al., 2012); or as illegitimate, and therefore as a basis for reduced pride and increased guilt (Brown et al., 2008; Baumeister et al., 1994; Tangney & Dearing, 2003). The results of the two studies strongly suggest that emotions communicated by ingroup or outgroup members in reaction to parochial group-serving behavior encourage a pride-reducing or guilt-enhancing framing of this behavior.

Our findings are consistent with social appraisal accounts of emotion (e.g., Manstead & Fischer, 2001; van der Schalk et al., 2015), and clarify the processes by which emotion

expressions influence other people's resource-allocation decisions and shape trust between groups. Specifically, both anger expressed by an outgroup member and guilt expressed by an ingroup member appear to encourage higher allocations and reinforce fairness. Anger expressed by a disadvantaged outgroup member threatens ingroup interests by signaling readiness to confront (Leach, 2016), thereby threatening the opportunity to maximize the common resource pool, whereas guilt expressed by a trust-violating ingroup member draws participants' attention to the breach of moral standards (Baumeister et al., 1994). In our research, expressions of these emotions caused a decrease in participants' feelings of pride and an increase in their feelings of guilt, respectively. Consistent with previous evidence (e.g., Harth et al., 2013; Lelieveld et al., 2013), these changes in participants' emotional state predicted the amount of resources they sent to the harmed group. Our findings also support previous research on anger (de Vos et al., 2013; van Kleef et al., 2004) by suggesting that expression of this emotion can improve relations between groups in potentially conflictual situations following breaches of trust. Whether this influence is due to anger communicating the importance of the relationship or presenting strategic information about thwarted personal gains is an issue to be explored in future research.

Although outgroup expressions of anger and ingroup expressions of guilt were effective in influencing ingroup emotions and behavior, the same was not true of outgroup expressions of disappointment or ingroup expressions of happiness. As noted earlier, disappointment is a weaker emotion than anger, in that it implies a less antagonistic stance, and it seems that, when expressed by the disadvantaged outgroup, it is insufficient to change ingroup emotions or behavior (Lelieveld et al., 2013). Regarding ingroup expressions of happiness about the group-serving behavior, we noted earlier that such expressions could signal pleasure at the ingroup's advantage and/or pleasure at the outgroup's disadvantage. The former might provide a basis for increased pride, while the latter might provide a basis

for increased guilt. This ambiguity about the object of the ingroup member's expressed happiness might help to explain why it did not result in significant changes in ingroup emotions or behavior. Future studies could assess the effects of more object-specific emotion communications.

It is worth noting that previous studies of intergroup guilt and pride have tended to assess these emotions using self-reports of feelings about past wrongdoings of one's national ingroup towards other groups (e.g., Brown et al., 2008; Harth et al., 2008, Iyer, Schmader, & Lickel, 2007; McGarty et al., 2005; Swim & Miller, 1999). In these studies, reparative actions are typically indexed by behavioral intentions (e.g., Doosje et al., 1998), attitudes towards affirmative action (Swim & Miller, 1999), or evaluations of official apologies (McGarty et al., 2005). A strength of the current research is that we measured actual behavioral outcomes indexed by participants' economic decisions. We also manipulated intergroup behavior and assessed feelings of pride and guilt in a live and dynamic setting, using the trust game – a flexible experimental tool that models the features of actual intergroup contexts and thereby enables a controlled study of the variables affecting behavior in natural circumstances (Bornstein, 2003). The present findings are consistent with those from studies that examine the links between feelings about group behavior and behavioral intention in real-world groups (e.g., Brown et al., 2008, Harth et al., 2013, Solak et al., 2016).

Importantly, the effects of emotion communication in the present research were found in a quasi-minimal group context, where the groups were approximately 15 minutes old by the time the intergroup trust game started. The use of minimal groups is both a limitation and a strength of the present studies. We modeled violations of trust between new groups, without a history of previous interactions, which arguably reduces the ecological validity of the study. Intergroup emotions are best understood in context (Leach, 2016), because the history of intergroup relations likely impacts the effects of communicated emotions. Groups may have a

neutral, cooperative, or conflictual history (de Vos et al., 2013). The present studies model a cooperative or neutral intergroup context, and the use of a minimal group paradigm in a laboratory study provides a conservative test of the effects of emotions in these intergroup settings. It is therefore noteworthy that the emotion expression manipulation administered in this setting had a significant impact on emotions and behavior in both studies. Arguably, these effects would be even stronger in natural groups that provide the basis for significant aspects of one's identity. Specifically, the positive effects of anger in Study 1 and guilt in Study 2 should be stronger, as should the effect of the happiness condition in Study 2, when there is a valued relationship and a more pronounced distinction between ingroup and outgroup. However, for groups with a history of conflict, expressed anger and guilt may have a less positive effect, and expressed happiness in Study 2 might elicit more unfair behavior.

Accordingly, investigating how observers' guilt and pride affect economic decisions in natural groups is a promising avenue for future research. Another promising direction for future research is to assess participants' perceptions of the appropriateness or legitimacy of the emotional reactions of the ingroup and the outgroup representatives. Ratings of ingroup reactions to unfairness may be especially informative in providing insights into the phenomenon of emotional nonconformity, its boundary conditions, and its potential to shape economic behavior (Goldenberg, Saguy, & Halperin, 2014). In the current research, ingroup happiness did not significantly affect participants' reactions. However, it is possible that in the context of real-world groups and a more serious transgression, displays of ingroup happiness following such violation would have elicited guilt and increased resource allocation.

Given that our ultimate goal is to shed light on how emotional expression can restore trust between groups following a group's failure to reciprocate a trusting move from another group, it could be argued that the evidence of trust restoration was rather meager. Even in the

conditions in which the outgroup expressed anger, or the ingroup member expressed guilt, the mean number of tickets allocated to the outgroup in round 2 was not high in absolute terms, leaving a disparity between ingroup and outgroup resources. The strong positive correlation between this measure and participants' willingness to compensate for the outcome of round 1 observed across both studies (see Supplementary Materials, Table S1 and S2) suggests that participants' allocations provide some indication of their reparatory intentions. However, the objectively low number of tickets allocated may reflect the inherent difficulty of establishing cooperation between groups (Folmer et al., 2012; Folmer, Wildschut, De Cremer, & van Lange, 2017) – especially when one group has acted in such a group-serving manner in the first round, thereby establishing a social norm of parochial behavior (Fowler & Christakis, 2010). There was nevertheless a significant impact of emotion, which highlights the fact that emotion expressions have the potential to influence intergroup interactions even in the context of highly unfair exchanges.

We believe that this effect of emotion communication is likely to generalize across experimental paradigms and shape intergroup exchanges using other economic games. Indeed, our results are in accord with studies examining the effects of communicated emotions in interpersonal exchanges using the ultimatum game (van der Schalk et al., 2015) and negotiation tasks (Lelieveld et al., 2013; van Kleef et al., 2006). Research also demonstrates the positive impact of experienced guilt on reparatory behavior in intergroup interactions using a variety of paradigms (Doosje et al., 1998; Gino et al., 2009; Harth et al., 2013). The findings from the current studies suggest that emotions are likely to influence resource allocation decisions and intergroup trust in intergroup exchanges through their influence on experienced emotion. Importantly, research on guilt in interpersonal settings suggests that the beneficial effects of this emotion may depend on perceived spontaneous

versus strategic motivations of the expresser (Shore & Parkinson, 2017). Whether this influence extends to intergroup settings deserves to be explored in future studies.

Together, the findings reported here show that the emotions communicated by either ingroup or outgroup members following a group-serving move in an intergroup trust game shape participants' own emotional experience and future allocation behavior. This demonstrates the importance of communicated emotions in establishing (or re-establishing) trust between groups and provides support for the application of social appraisal accounts of emotion to intergroup settings. Returning to Adam Smith, we believe that both ingroup and outgroup expressions of emotion can remind ingroup members that "when we prefer ourselves so shamefully and so blindly to others, we become the proper objects of resentment" (III.1.46). Because they have the power to evoke emotional reactions in individual and intergroup settings, expressions of emotion can help to create or restore cooperation when trust is a scarce resource.

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Footnotes

¹ In both studies, at the end of the experimental session, participants answered 3 single-choice questions to confirm that they understood the task, namely: “Imagine that your Game Partner gave you 5 tickets. How many tickets would this person have kept for himself or herself?”; “How many tickets did your Game Partner have at the beginning of the game?”; and “If your Game Partner gave you 9 tickets, how many tickets would you have had (along with the tickets that you received at the beginning of this round)?”.

² Correlations between all key dependent variables are reported in the Supplementary Materials.

³ Including group size, participants’ proneness to guilt (as measured by TOSCA) or Social Value Orientation as covariates did not change the pattern of results. The main effect of outgroup Emotion on participants’ allocations was significant in all three analyses, $F(2, 63) = 3.13, p = .05, \eta^2_p = .09$; $F(2, 61) = 3.44, p = .038, \eta^2_p = .10$; $F(2, 63) = 3.33, p = .04, \eta^2_p = .10$, respectively. These three measures were not the focus of the present research and will not be discussed further.

⁴ Because the emotion factor had three levels, all mediation analyses reported in this paper used two dummy variables, comparing each emotion condition with the control condition. The variable of interest was entered as the main predictor and the other variable was entered as a covariate.

⁵ Due to a programming error, the number of tickets that could be returned was constrained to a value between 0 and 10. In practice this error made little difference to the results: Participants were not aware of this restriction, only 4 out of 147 participants (2.7%) chose to return 10 tickets, and the modal number returned was 2.

⁶ Analysis of participants’ ratings of the representative’s positivity revealed an identical pattern of results: There was a significant effect of emotion condition, $F(2, 144) = 75.14, p <$

.001, $\eta^2_p = .51$. Ratings were significantly lower in the guilt condition ($M = 2.30$, $SD = 0.75$) than in the control condition ($M = 3.89$, $SD = 0.84$), $p < .001$, with the difference between the happiness condition ($M = 4.09$, $SD = 0.83$) and the control condition not being significant, $p = .48$.

⁷ The pattern of results remained similar after controlling for participants' proneness to guilt (as measured by TOSCA), $F(2,135) = 2.75$, $p = .07$, $\eta^2_p = .04$, and for the confederate's identity, $F(2,143) = 3.27$, $p = .04$, $\eta^2_p = .04$.

Intergroup Emotional Exchange: Ingroup Guilt and Outgroup Anger Increase Resource Allocation in Trust Games

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Supplemental Materials

Table S1

Study 1: Correlations between participants' allocations in the second round of the trust game, emotions and appraisals.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Allocation (0-22)	4.70	3.58											
2. Interested (1-7)	4.84	1.33	-.24										
3. Enthusiastic (1-7)	3.98	1.51	-.17	.73***									
4. Upset (1-7)	2.30	1.65	.07	.09	.09								
5. Proud (1-7)	2.15	1.47	-.41***	.37**	.51***	.12							
6. Happy (1-7)	3.24	1.78	-.38**	.47***	.58***	.06	.63***						
7. Attentive (1-7)	4.76	1.42	-.23	.65***	.58***	.13	.37**	.45***					
8. Guilt: Before allocation (1-7)	2.72	1.78	.09	-.10	.10	.55***	.20	.09	.03				
9. Guilt: After allocation (1-5)	1.82	0.89	.36**	-.19	-.07	.23	.06	-.16	-.03	.48***			
10. Responsibility (1-5)	1.94	1.25	.10	.03	.06	.19	.04	-.02	.15	.17	.49***		
11. Willingness to compensate (1-5)	2.41	1.21	.48***	-.04	-.07	.14	-.06	-.21	-.04	.05	.21	.12	
12. Fairness of the representative (1-5)	1.53	1.01	.02	.08	.08	-.13	.13	.15	.16	-.10	-.13	.15	-.01

Note. Correlations in bold are significant, with * denoting $p < .05$, ** denoting $p < .01$, and *** denoting $p < .001$.

Table S2

Study 2: Correlations between participants' allocations in the second round of the trust game, emotions and appraisals.

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Allocation (0-10)	3.37	2.52										
2. Interested (1-5)	3.79	0.77	.02									
3. Enthusiastic (1-5)	3.40	0.93	.05	.59***								
4. Upset (1-5)	1.29	0.71	.33***	.04	.01							
5. Proud (1-5)	1.90	1.04	-.18*	.08	.23**	-.13						
6. Attentive (1-5)	3.41	0.87	.06	.29***	.38***	.15	.21**					
7. Guilt: Before allocation (1-5)	2.60	1.17	.47***	.06	.14	.36***	-.24**	.05				
8. Guilt: After allocation (1-5)	2.63	1.16	.36***	-.01	.03	.28**	-.23**	-.10	.64***			
9. Responsibility (1-5)	2.39	1.11	-.13	.20*	.34***	.18	.19*	.12	.04	.13		
10. Willingness to compensate (1-5)	2.70	1.09	.56***	.07	-.01	.26**	-.28**	-.03	.44***	.60***	-.12	
11. Fairness of the representative (1-5)	2.13	1.12	-.33***	.07	.09	-.18*	.31***	.13	-.37***	-.43***	.18*	-.36***

Note. Correlations in bold are significant, with * denoting $p < .05$, ** denoting $p < .01$, and *** denoting $p < .001$.