

**The effects of feelings of guilt on the behaviour
of uncooperative individuals in repeated social
bargaining games: An affect-as-information
interpretation of the role of emotion in
social interaction**

Timothy Ketelaar

University of California-Los Angeles, USA

Wing Tung Au

The Chinese University of Hong Kong, Hong Kong SAR, China

In two studies we found that feelings of guilt provoke individuals to cooperate in repeated social bargaining games (a prisoner's dilemma in Study 1 and an ultimatum game in Study 2). Feelings of guilt were either experimentally manipulated (Study 1) or assessed via self-report (Study 2) after participants had played one round of a social bargaining game. As predicted, individuals who experienced feelings of guilt (compared to individuals who felt no guilt) after pursuing a non-cooperative strategy in the first round of play, displayed higher levels of cooperation in the subsequent round of play (even one week later). Results are discussed in terms of an "affect-as-information" model, which suggests that non-cooperating individuals who experience the negative affective state associated with guilt in a social bargaining game may be using this feeling state as "information" about the future costs of pursuing an uncooperative strategy.

Because in guilt the focus is on the specific, individuals are capable of ridding themselves of this emotional state through action (Lewis, 1993, p. 570)

Correspondence should be addressed to Timothy Ketelaar, Department of Psychology, MSC 3452, New Mexico State University, Las Cruces, NM 88001-8001; e-mail: Ketelaar@commstds.ucla.edu

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Given the conspicuous role that emotions appear to play in regulating social interactions why would one want to rid oneself of guilt? At a proximate level of analysis the remission of negative emotion is seen as an end in itself, either because the unpleasant affect associated with guilt is an aversive state that individuals are naturally motivated to remove (Forest, Clark, Mills, & Isen, 1979; Isen, Clark, & Schwartz, 1976; Isen & Simmonds, 1978) or because the experience of negative affect is seen as a potential source of bias and distortion in judgement and decision making (for a review, see Ketelaar & Clore, 1997). Along these lines, previous research has demonstrated that committing an apparent transgression (e.g., accidentally destroying someone's camera) often leads to greater helping behaviour in subsequent interactions with an unrelated third party (Cialdini, Darby, & Vincent, 1973; Cunningham, Steinberg, & Grev, 1980; Regan, 1971; Regan, Williams, & Sparling, 1972; Isen et al., 1976; Isen & Simmonds, 1978). In these studies it is assumed that guilt increases cooperation because individuals are motivated to reduce the aversive feeling state associated with their guilt. Presumably engaging in cooperative behaviour is an effective means of removing such feelings (Cialdini et al., 1973; Cunningham et al., 1980). Yet, surprisingly few of these studies have actually measured feelings of guilt after a transgression. A second criticism of these studies is that they often examine the effects of guilt in contexts that are irrelevant to the conditions that elicited this emotion in the first place (Ketelaar & Clore, 1997). The current studies examine the effects of guilt on behaviour in subsequent *relevant* situations (Studies 1 and 2) and include actual measures of feelings of guilt (Study 2).

Might feelings of guilt play a functional role in social interaction? An "affect-as-information" interpretation. Previous research on guilt and cooperation has typically inferred the presence of guilt feelings from the mere act of committing a transgression (e.g., all individuals in the "transgression" condition in these studies are considered to be in the "guilt" condition, Cialdini et al., 1973; Cunningham et al., 1980; Regan, 1971; Regan et al., 1972). In contrast to this sociolegal interpretation of guilt (see Ortony, 1987), the psychological meaning of guilt refers to a particular variety of consciously accessible mental state, characterised by a specific feeling state, rather than the mere act of having committed a transgression *per se*. As a result, the existing literature on guilt and cooperation says little regarding the question of whether "feelings of guilt" produced when one transgresses against a particular individual are associated with greater cooperation in later interactions with that same individual.

Moreover, previous studies of the effects of guilt on cooperation have typically examined the influence of guilt on subsequent behaviour in irrelevant situations. In these studies negative affect is typically seen as a bad thing to be removed, rather than a strategic mental state that may be guiding subsequent behavioural choices. As such, cooperation is simply a pleasant side effect of

striving to either remove this aversive state or to maintain one's pleasant state (Cialdini et al., 1973; Isen et al., 1976; Isen & Simmonds, 1978). Similarly, research in the social cognition tradition has suggested that negative feeling states can lead to "reduced motivation for thoughtful analysis" or even "reduced capacity for such analysis" (Bodenhausen, Sheppard, & Kramer, 1994, p. 59). In either case, negative affect is not seen as playing a functional role in social interactions, but rather as something to be got rid of. When viewed from the more distal level of possible evolutionary functions, however, the presence of negative affect is often seen as a means to an end rather than an end in itself (Alexander, 1987; Hirshleifer, 1987; Ketelaar & Clore, 1997; Ketelaar & Todd, 2002; Nesse, 1990; Nesse & Williams, 1994; Tooby & Cosmides, 1990). From this perspective one wonders whether the negative feeling state associated with guilt, aversive as it may be, might actually be a positive feature of this emotion, because this feeling state can motivate social behaviour that is often beneficial over the long run.

The emotion of guilt can be described as occurring when an individual has appraised his/her current situation as "bad" with regards to the observation that they have violated an important social norm in a blameworthy manner (Ortony, Clore, & Collins, 1988; see also Ketelaar & Clore, 1997; Ketelaar & Todd, 2001). The first set of appraisals (e.g., good vs. bad) can be referred to as the affective component of this emotion and the second set of appraisals (e.g., blameworthy violation of a social norm) can be referred to as the cognitive component. Previous research on the affective component of emotional states has shown that when an emotion is induced in one context (e.g., viewing a happy or sad movie) and then utilised in an irrelevant context (e.g., to evaluate political candidates or electrical appliances) individuals often rely on a "How do I feel about this?" heuristic in which their affective reaction to the prior emotion-eliciting context biases their subsequent judgement of objects, agents and events (Schwarz, Clore, & Conway, 1994). These studies typically reveal that evaluative judgements are more negative when an individual is experiencing negative affect than when they are experiencing positive affect (reviewed in Ketelaar & Clore, 1997; Schwarz et al., 1994). Accordingly, this perspective on emotion and judgement has been referred to as the "affect-as-information" model (Schwarz & Clore, 1983, 1988; Schwarz et al., 1994). Yet, these studies typically examine the effects of affective feelings in contexts that are irrelevant to the conditions that elicited the affect in the first place (Ketelaar & Clore, 1997). As a result these studies do not say much about the potential effects of affective feelings on behaviour under circumstances where one's affective state might plausibly provide "relevant" information.

Rather than focus on the remediation of the negative affect associated with guilt as an end in itself, this paper explores the idea that, by virtue of providing "affective information" that is relevant to strategy choices, the experience of guilt might actually provoke the adoption of certain behavioural strategies that

are known to fare well in certain types of repeated social bargaining games. Following Frank (1988), we describe how affective feeling states might inform strategists of the long-term consequences of pursuing different strategy options in a common decision-making scenario known as the “commitment problem”.

The game theoretic structure of commitment problems. Commitment problems centre around a class of dilemmas where the strategy choice that maximises one’s immediate self-interest is at odds with the strategy choice that maximises one’s long-term self-interest. Using game theory, the economist Robert Frank (1988) points out that what constitutes a “rational” value-maximising strategy choice often depends on whether the individual is committed to maximising value over the long-run or in the short-run. Consider the following anecdote about a so-called “town fool” (adapted from Gigerenzer, 1996):

The story goes that there once was a town fool. He was so foolish that whenever he was offered the choice between a pound and a shilling (1/20th of a pound) he would always choose the shilling. The townsfolk were quite amused. Repeatedly they would offer him the choice of a shilling and a pound, every time he would take the shilling. People traveled from miles around to witness this phenomenon. Day in and day out, the town fool always took the shilling, never the pound. This continued for years. He retired a very rich man.

In the example of the town fool, the immediate incentive of choosing the higher value coin competes with the more distal incentive of being offered this choice repeatedly in the future. When viewed as a single choice, the town fool’s behaviour appears irrational. Yet, when this same choice is framed as a repeated game, where a particular choice determines the probability of getting to choose again, the so-called fool’s behaviour looks quite different (Gigerenzer, 1996). It turns out that some strategies that look good in the short-run, actually fare quite poorly as long-term strategies in repeated bargaining games that resemble the commitment problem (Frank, 1988).

Although formal models such as those based on game theory (Axelrod, 1984; Meardon & Ortman, 1996) and principles of rational discounting (Herrnstein, 1970; Loewenstein, 1987; O’Donoghue & Rabin, 1999) can help explain why it is often good to forego immediate rewards, such explanations do not deal with the psychological mechanisms that actually accomplish this commitment to long-term self-interest. This is where Frank’s (1988) model of emotions as commitment devices enters the picture. Frank’s (1988) Commitment model proposes that emotion helps solve the problem of overcoming the attraction of immediate rewards [see Hirshleifer, 1987 and Simon, 1967 (reviewed in Ketelaar & Goodie, 1998) for a similar views]. Frank (1988) argues that emotions operate in a manner analogous to the town fool’s strategy, by provoking indi-

viduals to forego their immediate self-interest in order to pursue a more effective long-term strategy.

Although the “affect-as-information” model (Schwarz & Clore, 1983) was originally developed to explain the influence of relatively context-free mood states on subsequent judgement, the affective cues of emotions might serve a similar informative function as that described by Frank (1988). For example, the negative feeling state associated with guilt might serve to “inform” the individual that their current situation is appraised as “bad” with regard to the observation that they have violated an important social norm (e.g., the norm for cooperation or fairness) in a blameworthy manner. By the same token, the very individuals who should be most susceptible to the effects of this “affective information” should be those strategists who are actively considering, or have actually chosen, the uncooperative or “defect” strategy in a social bargaining situation. These are the very individuals who might interpret the negative affect associated with guilt as applying to their appraisals of the blameworthiness of their own actions. Armed with this “affective” information, these individuals might then behave differently than if they did not have access to such information.¹

Overview of the two experiments

In the current paper, we explore whether individuals who experience feelings of guilt (compared to those who do not) while considering various strategy options in a repeated social bargaining game behave like individuals who are attempting to solve the commitment problem. In two experiments, participants are asked to make behavioural choices (*cooperative*: upholding social norms of fairness/equity or *uncooperative*: violating social norms of fairness/equity). In the second stage of the experiment feelings of guilt are either manipulated or assessed (via self-report), and participants are then asked in the third stage of the experiment to again make behavioural choices in the same manner as in the first stage. Of particular interest is whether individuals who experience feelings of guilt while considering non-cooperation will utilise the “affective information” associated with these “guilt feelings” to avoid pursuing this strategy option in the final stage of this social interaction. The basic hypothesis is that only those individuals who do not cooperate in the first stage *and* experience feelings of guilt in the second stage, will be more likely to cooperate in the third stage.

¹ Such a view assumes that the affective state associated with each emotion occurs in the context of a particular set of cognitive appraisals unique to that particular emotion. This “cognitive frame” can then be used as a guide toward applying the affective information that accompanies one’s emotional reaction (Ketelaar & Todd, 2001; Ketelaar & Clore, 1997).

Predictions

Guilt feelings are, of course, not the only source of cooperative behavior. It is also expected that participant's cooperative behaviour will vary as a function of the social motives of the participant (e.g., pre-existing tendencies toward cooperative or uncooperative behaviour) as well as the social motives of their interaction partner. Specifically, one would predict that participants who displayed more "cooperative" behaviour (relative to other participants) during the earlier rounds of play will continue to display more cooperative behaviour during the later rounds of play, and that participants will cooperate less when they play against an uncooperative (as opposed to cooperative) partner. Of central interest, however, is the prediction that individuals who pursue a non-cooperative strategy, *and* experience corresponding feelings of guilt, will be more likely to cooperate in subsequent social interactions (with the same partner) than individuals who felt no guilt while behaving uncooperatively during the first stage.

STUDY 1: GUILT IN A REPEATED PRISONER'S DILEMMA

To the extent that commitment problems provoke individuals to choose between strategies where the immediate pay-offs differ from the long-run pay-offs, one might use the logic of game theory to justify how behaviour that is contrary to one's immediate self-interest may be beneficial to one's material well-being in the long run. In the classic prisoner's dilemma game (Axelrod, 1984; Kollock, 1998; Komorita & Parks, 1999; Rapoport & Chammah, 1965), for example, there are two players, and each has two choices (cooperate or defect). One's pay-off depends not just on what one chooses to do (cooperate or defect), but also on what the other player chooses. For the sake of simplicity we consider only the case when pay-offs are symmetric between the two players. In the standard prisoner's dilemma the worst possible pay-off occurs when one player chooses to cooperate and the other player chooses to defect (the sucker's pay-off). When playing a single-shot prisoner's dilemma game, one can maximise the immediate expected pay-off by choosing the dominant strategy of defection. What makes the prisoner's dilemma game interesting is that if both players attempt to maximise their immediate rewards by enacting their dominant strategy (defect), both players are worse off than they would be if they had both decided to cooperate (see Axelrod, 1984; Kollock, 1998; Komorita & Parks, 1999).

Presumably guilt is more likely (compared to other emotions²) to be attributed to one's evaluation of "defection" in the prisoner's dilemma precisely because this "self-reproach" emotion (see Ortony et al., 1988) involves

² An affect-as-information model actually leads to the expectation that any negatively valenced emotion (e.g., shame, guilt, embarrassment, anger, etc.) experienced while considering defection could be misattributed to the individuals judgement of the value of the defection option.

appraisals of the blameworthiness of violations of social norms (such as the norm of cooperation/fairness). Presumably, this use of negative affect as “information” about strategy choice could occur even when the source of one’s guilt feelings is truly irrelevant to the current situation (e.g., due to an experimental “guilt induction”). If, for example, the individual merely experiences guilt (for whatever reason) *while* considering defection in the prisoner’s dilemma, it follows that the negative affect associated with this emotion could be attributed (correctly or incorrectly) to one’s evaluation of this strategy choice. Such a misattribution model assumes, of course, that the individual is unaware of the source of their feelings (Schwarz & Clore, 1983, 1988). In cases where the source of the emotion is extremely salient, one expects that the individual might correct, or even overcompensate, for the influence of emotion. In such cases, one might expect that opposite effects of those predicted here, namely, that guilt inductions will trigger less cooperation because participants are trying to compensate for a truly irrelevant bias towards cooperation.

Method

Participants

Participants were 64 undergraduates (50% male) at a large Midwestern university who participated in partial fulfilment of requirements for their introductory psychology course.

Procedures

Participants came to the laboratory in small groups of approximately eight (all groups were same-sex groups) and were informed that they would interact in pairs with another member of the group as part of a computer decision-making task. All participants were told that they would receive a small monetary incentive (on average \$2) based on their performance on the task. In actuality, all participants played the prisoner’s dilemma game against a computer programmed to play a particular strategy (see below) and all participants received the same amount of money (\$2) at the conclusion of the experiment. Moreover, the task was referred to as a “computer task” and not as a prisoner’s dilemma game and participants were lead to believe that they were playing against another human (not a computer program).³ The cooperation and defection

³One reviewer noted that the use of deception (providing a misleading cover story) in Study 1 was contrary to the professional conventions employed in experimental economics research. Experimental economists typically assume that all instances of deception should be strictly avoided because they may result in “reputational spill over” in the sense that all experimental settings can be viewed as repeated games involving both experimenters and research participants (see Broeder, 1998 and Ortman & Hertwig, 1997 for opposing views). Although we do not deny the possibility of such effects, we believe that our methodology meets the APA ethical guidelines for the use of deception in research.

choices were labelled as “A” and “B” and nothing related to cooperation or defection was mentioned in the instructions. On each trial, the computer displayed the profit table and the participants made their choices by pressing either “A” or “B”. The profit table corresponded to the standard prisoner’s dilemma pay-off matrix (see Axelrod, 1984; Rapoport & Chammah, 1965). After a random time delay that mimicked computer network traffic and possible decision time lag of the “other player”, the computer displayed the outcome of both players’ choices and their pay-offs. Participants were simply told that they would play a large number of trials of this task and that they would then take a short break to do another activity before completing the second session of trials. All participants completed eight blocks of 10 trials for a total of 80 trials.

Guilty mood induction. After the first four blocks of 10 trials, participants were asked to engage in a second task involving writing a detailed description of an event. Of primary interest was the elicitation of negative affective feelings that are associated with the emotion of guilt. Participants were randomly assigned to one of two conditions: (1) simply writing a detailed description of a typical day (the control condition), or (2) writing a detailed description of a recent experience when they felt really guilty, ashamed, or self-blaming (the guilt condition). These three emotion words (i.e., “guilty,” “ashamed”, or “self-blaming”) were selected based on a theoretical model of the cognitive appraisal structure for “self-reproach” emotions (Ortony et al., 1988, pp. 137–155), which listed these terms (among others) as lexical “tokens” for emotions that involved attributions of disapproval for one’s own blameworthy actions. After writing for 10 minutes, participants were informed that they would again play a large number of trials of the computer task. Participants then played a second set of four blocks of 10 prisoner’s dilemma trials. The instructions for the computer task lead participants to believe that they would be interacting with the *same* human partner during all trials.

Provoking cooperation or defection. During the first four blocks of 10 trials the computer partner employed the same (tit-for-tat) strategy (Axelrod, 1984). However, during the second set of trials in both mood conditions, the computer “partner” was programmed to play either cooperatively or uncooperatively—depending on random assignment—during the first five trials of the first block of trials. Specifically, the cooperative or “nice” computer partner was programmed to begin the second session by selecting the cooperate response on the first five trials regardless of what the other person responded. The uncooperative or “nasty” computer partner began by selecting the defect response on the first five trials. In both cases, the computer program returned to the simple tit-for-tat strategy after these first five trials. This manipulation was introduced in order to provoke heightened or lowered levels of cooperation and to assess the role of guilt feelings in accentuating or diminishing propensities to

cooperate or defect when their partner displayed cooperative or uncooperative behaviours.

Individual differences in social motives. Social motives (or social value orientations) refer to individual differences in response strategies, such as the tendency to be cooperative or uncooperative (see Au & Kwong, in press; DeDreu & Van Lange, 1995; Kollock, 1998; Messick & McClintock, 1968). Measuring individual differences in social motives is important because a general interpretation of the “affect-as-information” model would suggest that everyone who is made to feel bad (i.e., guilty) will evaluate their strategy choices differently and thus change their subsequent behaviour. Yet, because cooperative behaviour is not a plausible source of guilt feelings, a more strategic view of the affect-as-information model would suggest that guilt might serve as meaningful information only to those individuals who had violated an important social norm (e.g., cooperation) in a blameworthy manner (see Ortony et al., 1988). Along these lines, responses during the first 40 trials were used to categorise participants as possessing cooperative or uncooperative social motives. Specifically, individuals who scored above the median level of cooperation on the first set of 40 trials (median = 46.25 % cooperative responses) were labelled “cooperative” players, those who scored below the median were labelled “uncooperative” players.

Results

When the percentage of cooperative responses during the second set of four blocks of 10 trials were analysed, a significant interaction between emotion condition (guilt vs. control) and social motives (cooperative vs. uncooperative players) was observed *across the four blocks of 10 trials*, $F(3, 168) = 3.90, p = .01$. Specifically, the guilt manipulation appeared to have a significant impact on cooperation levels *only during the first block of ten trials* of the second session of the prisoner dilemma game, $F(3, 168) = 91.3, p < .0001$ and uncooperative participants tended to show lower levels of cooperation (compared to cooperative participants) across all four blocks of 10 trials, $F(1, 56) = 14.14, p < .0001$. Because the effects of emotion on cooperation are of central importance here, the remaining analyses are strictly between-subject analyses focusing on these first 10 responses during the second set of 40 trials.

Guilt leads to greater levels of cooperation

As predicted, a significant main effect for emotion (guilt vs. control condition) was observed during the first 10 trials of the second session, $F(1, 63) = 6.26, p = .02$, with participants in the guilt condition displaying higher levels of cooperation (53% cooperative responses) compared to participants in the control condition (39% cooperation). Main effects were also observed for the social

motives of the participant, $F(1, 63) = 55.07, p < .0001$, and the social motives of their “computer” partner, $F(1, 63) = 37.53, p < .0001$. As predicted, uncooperative players cooperated less often (25%) than cooperative players (68%) during these first 10 trials. Similarly, players who interacted with the “nasty” computer partner displayed lower levels of cooperation during the first 10 trials (29%) than players who interacted with “nice” computer partner (64%).

Guilt increased cooperation most in uncooperative individuals

Table 1 shows the percentage of cooperative responses on these first 10 trials as a function of emotion condition and the social motives of the player and their computer “partner”. As predicted, uncooperative players tended to show the largest effects of the guilt manipulation. Specifically, guilt appeared to increase cooperative responses most in those individuals who displayed less cooperation during the first set of 40 trials. This observation was reflected in a significant three-way interaction between emotion (guilt vs. control), social motive of player (cooperative vs. uncooperative), and social motive of computer partner (nice vs. nasty), $F(1, 63) = 4.42, p = .04$.

Discussion

In the repeated prisoner’s dilemma game individual strategists are confronted with a choice between the immediately attractive strategy of defection and more “cooperative” strategies (e.g., continuous mutual cooperation, tit-for-tat, etc.) that, although less attractive in the short-run, tend to be more successful in the long-run (Axelrod, 1984). Consistent with the hypothesis that the negative affect associated with guilt provides “information” about the costliness of a *blame-worthy violation of a social norm*, a laboratory guilt induction provoked unco-

TABLE 1
Percentages of cooperative responses in a repeated prisoner’s dilemma game as a function of emotional state, social motives, and strategy of the computer partner

Social motives of the player	Strategy of “computer” partner			
	Uncooperative (nasty)		Cooperative (nice)	
	Guilty mood	Neutral mood	Guilty mood	Neutral mood
Uncooperative	22.9% (n = 7)	13.3% (n = 9)	51.1% (n = 9)	10.0% (n = 7)
Cooperative	45.0% (n = 10)	45.0% (n = 8)	93.0% (n = 6)	99.0% (n = 8)

operative individuals to avoid the “defect” option and increase their level of cooperation during the second round of play.

Guilt as information in the repeated Prisoner’s Dilemma

These results suggest that guilt feelings produced by one source (e.g., undergoing an experimental “guilt induction”) can be misattributed to a second source (deciding which strategy to play in a repeated prisoner’s dilemma game). Because the affective state associated with guilt is negative (rather than positive), feelings of guilt focus attention on the *blameworthiness* rather than the *praiseworthiness* of one’s actions (Ortony et al., 1988). Thus, it is not surprising that individuals could easily “misattribute” their negative affect to their evaluation of the initially attractive option of defection because defection is often seen as a blameworthy violation of a general norm of cooperation. By contrast, cooperation is rarely seen as blameworthy or as a violation of a social norm. Consistent with this line of reasoning, guilt had less (or no) impact on the behaviour of cooperative individuals in a repeated prisoner’s dilemma.

Even though this negative affect occurred in the context of a particular emotion (guilt), these findings are consistent with an “affect-as-information” interpretation which suggests that the cognitive appraisal structure of a particular emotion can aid the individual in applying the “affective information” that accompanies this emotion. A more general interpretation of the “affect as information” model would suggest that anyone who feels bad (i.e., guilty) will evaluate their strategy choices differently and thus change their subsequent behaviour. By contrast, a more functional view of the affect-as-information model suggests that guilt will serve as meaningful information only to those individuals who had violated an important social norm (e.g., by not cooperating). The current results are consistent with this functional view of affect-as-information because the effects of guilt on behavior were limited mainly to uncooperative folks.

Although the current findings are consistent with the view that it was the negative affect component of guilt that lead to increased cooperation, one cannot rule out the possibility that another negative emotion, such as “shame”, rather than guilt *per se*, gave rise to the “negative affect” that lead to increases in cooperative behaviour. Remember that the “guilt” induction asked participants to recall a time when they felt “guilty”, “ashamed”, or self-blaming”. Although guilt and shame both possess a negative affective component, they differ subtly in their cognitive appraisal structure. Shame tends to focus more on the global appraisal of the self as a bad person whereas guilt tends to focus on appraisals of specific actions as blameworthy (Lewis, 1993). Finally, the effects of this emotion were rather short-lived, being limited to the first 10 trials following the emotion induction. One explanation for these short-lived effects of

guilt on cooperation could be that the aversive negative feeling state—produced by writing the story—has a short half-life. Perhaps it is the case that as the aversive affective state associated with “guilt” diminished, the immediately attractive strategy of defection became more palatable.

Most studies demonstrating a link between transgression and subsequent cooperation have simply *inferred guilt from the mere act of transgressing, rather than measuring guilt through self-report or other means* (Carlsmith & Gross, 1969; Cialdini et al., 1973; Cunningham et al., 1980; Regan, 1971; Regan et al., 1972). As one researcher notes: “many social psychological studies that have examined prosocial behaviour or compliant behaviour, following a prior transgression, often construe such subsequent behaviour as an index of guilt without inquiring about internal states” (Tangney, 1991, p. 598). Because previous studies did not measure guilt feelings, the effects of guilt on cooperation might have been underestimated if individuals who felt no guilt after the transgression were included in these analyses as “guilty” individuals. Although the current study had the advantage of being able to assess the effects of a laboratory guilt manipulation over time (and observed that these effects appear to be relatively short-lived) it is not clear that *all* individuals in the guilt condition actually felt guilt or that *all* individuals who merely commit a transgression will later feel guilty. To address these issues, Study 2 was designed to: (1) measure the presence or absence of guilt feelings as they occurred immediately following a transgression; and (2) to observe whether guilt can exert more long-term effects (up to one week later) on cooperative behaviour.

STUDY 2: GUILT IN A REPEATED ULTIMATUM GAME

Laboratory studies of behaviour in social bargaining games often employ experimental manipulation of variables, anonymous pairings of individuals, and the use of computer partners (as in Study 1). While these procedures increase experimental control, they may affect the generalisability (ecological validity) of the findings. In particular, the employment of computer partners or anonymous pairings of participants may affect participants expectations of reciprocity/retribution (see Hoffman, McCabe, & Smith, 1996; McCabe et al., 2000). Hoffman et al. (1996) found, for example, that increasing the social distance between participants—by increasing anonymity—leads to more self-interested behaviour (and thus decreases in cooperative behavior) in a dictator game (but see Bohnet & Frey, 1999 for a contrary view). Moreover, laboratory manipulations of guilt can obscure our understanding of naturally occurring individual differences in the tendency to feel guilt (or not) after a transgression. Because of these concerns over ecological validity, participants in Study 2 engaged in a negotiation task, the repeated ultimatum game, during which *naturally occurring feelings of guilt* were assessed via self-report. Moreover, participants were

not paired anonymously, but instead were asked to pair up with a colleague from their class for the purpose of participating in a negotiation task that spanned several days (one full week) rather than just one hour. Of particular interest was whether individuals who behaved selfishly at time 1 *and* felt guilty about their behaviour would be more likely to engage in generous (nonselfish) behaviour at time 2 (one week later) compared to individuals who felt no guilt after behaving selfishly the previous week.

The repeated ultimatum game

The ultimatum game is a two person social bargaining game in which the task is to divide a sum of money, say \$19 (Guth, Schmittberger, & Schwarz, 1982). One person proposes an offer, or ultimatum, on how to split the money and the second person can either accept or refuse the offer. If the offer/ultimatum is accepted, the sum of money is divided in the manner proposed by the first person, otherwise if the offer is refused no money is distributed.

One interesting twist to the ultimatum game is that the selection of possible offers (\$9 for me, \$10 for you, etc.) can be arranged such that it is impossible to make a completely fair offer. For example, in the present study participants were asked to negotiate a division of \$19, where the possible divisions *had to be in whole dollar increments*.⁴ Given the odd number of dollars to be divided (\$19) the range of possible divisions of money in the present study ranged from extremely *generous* offers (\$0 for me, \$19 for you) to extremely *selfish* offers (\$19 for me, \$0 for you), but could never be completely fair (i.e., a 50/50 split). Because a fair split of the money was impossible, the closest approximation to a fair offer would be a slightly selfish offer (\$10 for me, but only \$9 for you) or a slightly generous offer (only \$9 for me, but \$10 for you). In the current study, individuals engaged in this ultimatum task twice (over a one week period) with the same interaction partner. Individuals were randomly assigned at the first interaction to take on the role of the person proposing the offer (the ultimatum maker) or the person deciding whether to accept the offer. These roles remained constant across the two negotiation sessions.

In a repeated ultimatum game where an equitable split of the resource is not possible on each occasion, one expects that most individuals will propose a slightly selfish offer in the first round of negotiation. Extremely selfish offers are less probable given that they are likely to be punished by rejection of the offer all together (see Thaler, 1992 for a review of the ultimatum game; also, Cashdan, 1980, 1989 for reviews of egalitarianism in resource allocation). However,

⁴This study actually used a “watered-down” incentive structure in which participants negotiated on how to divide 19 lottery tickets each worth \$1. These tickets were later entered into a lottery drawing in which a total of three tickets were selected and the “owner” of each of the three winning tickets would collect a \$25 prize. Each ticket constituted one entry into the lottery and each participant could enter the lottery as many times as they had tickets.

if a selfish offer is accepted in an earlier round of negotiation, an individual who conforms to a fairness norm (e.g., an equitable split of the resources) is likely to propose a more generous division of the resource during the second round of interaction with the same partner. In other words, if participants are employing a fairness norm we might expect that individuals who propose a relatively selfish offer at time 1 (\$10 for me, \$9 for you) will adjust their offer at time 2 (one week later) and make a relatively generous offer (\$9 for me, \$10 for you) at time 2 in order to balance out the accounts for these two transactions.

Method

Participants

Participants were 36 pairs of undergraduates⁵ (80.6 % female) at a large Midwestern university who participated in partial fulfilment of requirements for an undergraduate course.

Procedures

During the lecture portion of the course, participants in the ultimatum study were asked to select a negotiation partner from among their classmates. Most participants chose the person sitting in a chair next to them. Participants were then scheduled for two laboratory sessions (exactly one week apart) during which they were asked to report to another location (not the lecture hall) in order to engage in a negotiation task. Participants came to the laboratory with their negotiation partner (in groups of approximately 4 to 10) and the procedures for the negotiation task were explained to them. Players were then randomly assigned to be either Player A, who would propose an offer on how to divide the money, or Player B, who would accept or reject the offer. Players A and B were then moved to separate rooms. Player A made the proposal for splitting the money by filling in the blanks on a form that stated: "I propose that ___ dollars be given to me (Player A) and that ___ dollars be given to my partner (Player

⁵ These 72 students were selected from a larger sample of the 102 students enrolled in a semester-long course on personality and subjective well-being in which students were assigned to participant in one of two studies. 30 students (70% female) were excluded from participation in the current study as a result of their selection into the other study. These students were selected for the other study on the basis of their extreme scores on a measure of subjective well-being (SWB). 15 of the excluded participants displayed extremely high levels of SWB and 15 displayed extremely low SWB. Although this exclusion of participants reduced the sample size to 72 participants, this was not deemed problematic for the current study. If anything, the elimination of the more extremely happy and extremely unhappy participants may have decreased the likelihood of observing measurable emotional responses during the negotiation task by reducing the variability in affective responses. This resulted in a final sample of 72 participants, or 36 pairs of negotiation partners. 24 of these pairs were exclusively female-female groups, 12 of the pairs were mixed sex (male-female), and 3 of the pair were exclusively male. No significant sex differences in offers or rejections were observed.

B)'. Immediately after writing down their proposal, Player A was given a sheet of paper with a brief mood report in which they were asked to indicate on a scale of 0 (not at all) to 6 (extremely) how intensely they felt several different emotions, including guilt. Their proposal on how to divide the money was then carried to the next room where their partner (Player B) read the proposal and indicated their response by selecting one of two options (*accept* or *reject*). Participants were then dismissed and this negotiation task was repeated exactly one week later with the same arrangement, those individuals who were selected to make the offer the first week (Player A) were again asked to make an offer the second week. We are interested here only in the behaviour of Player A ($n = 36$), specifically the effects of guilt feelings at time 1 on subsequent offers made at time 2 (one week later).

Results

Selfish vs. generous offers at time 1

To test the prediction that guilty reactions to selfish offers at time 1 would increase the proportion of generous offers made at time 2, all proposals on how to split the money at time 1 were first categorised as either selfish or generous. Selfish offers were defined as all cases where Player A proposed to give more money to themselves than to their partner (Player B). Generous offers were defined as all cases where Player A proposed to give more money to their partner than to themselves. Using this scheme, selfish offers comprised 58.3% (21 of 36) of the offers made at time 1 and generous offers comprised 41.7% (15 of 36) of the offers.⁶ All offers made at time 1 were accepted by their negotiation partner at time 1.

Presence or absence of feelings of guilt at time 1

Self-reports of guilt feelings recorded after the offers at time 1 were used to separate individuals into two categories: (1) those who reported *no guilt feelings* after making their offer; and (2) those who reported *some feelings of guilt* after making their offer. Of the 36 individuals who made offers at time 1, only 12 (33.3%) reported any feelings of guilt. All 12 of these individuals had proposed selfish offers at time 1. Seven individuals rated guilt at '1' on a 0 to 6 scale, three individuals reported guilt at '2', and two individuals reported guilt at

⁶ A cut-off of proposing to give \$10 or more to oneself was used as the criterion for a selfish offer, the remaining offers were designated as generous offers. In all, 14 of the 36 offers (38.9%) were slightly generous offers of \$10 to one's partner, 18 of the 36 offers (50.0 %) were slightly selfish offers of \$9 to one's partner, and the remaining 11.1% of offers were offers of \$13, \$8, \$7, and \$1 dollar(s) to one's partner. This is consistent with previous findings in the ultimatum game literature (Guth et al., 1982; Hoffman et al., 1994) which have found that the majority of proposals tend to cluster around a 50/50 division of the money.

“3.” These individuals comprised 57% of the individuals (12 of 21) who proposed selfish offers at time 1.

Feelings of guilt at time 1 are associated with more generous offers at time 2 (one week later)

Figure 1 shows the percentage of generous and selfish offers at time 2 as a function of the type of offer at time 1 and whether or not feelings of guilt were reported at time 1. These differences in responses at time 2 as a function of guilt at time 1 were quite large, 91% of the individuals who felt guilty after making a selfish offer at time 1 made a generous offer at time 2, compared to only 22% of the individuals who felt no guilt after proposing a similarly selfish offer at time 1, $\chi^2(1, N = 21) = 10.51, p = .001$. There was no difference in the size of the offers given by guilty feeling and nonguilty feeling selfish individuals at time 1 (both groups had median offers of \$9 to their partners); thus, this effect could not be attributed to individuals who felt guilty after a selfish offer at time 1 having given a substantially more selfish offer than those individuals who reported no guilt, $t(8.18) = 1.17, p = .14$.⁷ Moreover, as predicted, it was observed that the

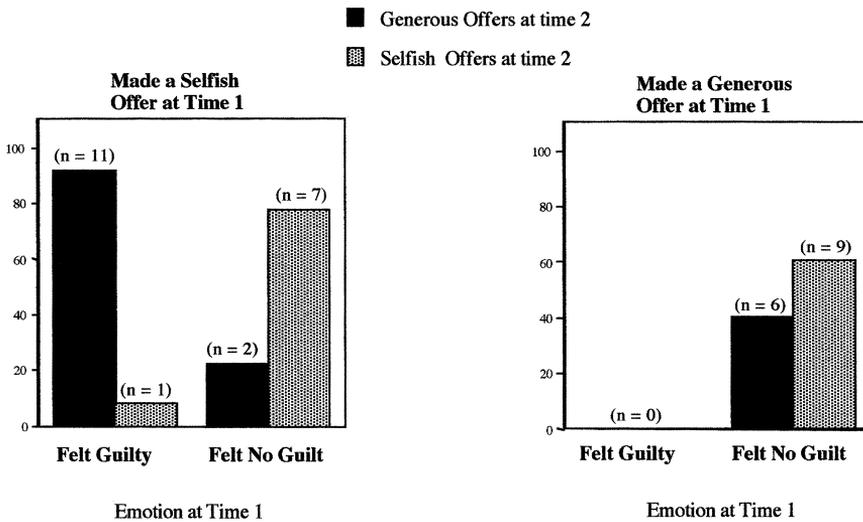


Figure 1. Percentages of generous vs. selfish offers at time 2 (one week later) as a function of the type of offer at time 1 (generous vs. selfish) and whether or not feelings of guilt were reported at time 1.

⁷ Note: Noninteger degrees of freedom are reported for this *t*-test, because Levene’s test for equality of variances revealed significantly different variances for both groups ($F = 8.41, p = .009$). The *t*-test for equal variances also displayed nonsignificant findings, $t(19) = 1.35, p = .10$.

majority of individuals (78%) who made selfish offers at time 1 *and* felt no corresponding guilt, continued to make selfish offers one week later (at time 2). There was no significant difference in the type of offers made at time 2 for individuals who felt no guilt at time 1, regardless of whether their initial offer at time 1 was selfish or generous; both groups tended to make selfish offers at time 2 (see Figure 1), $\chi^2(1, N = 24) = .80, p = .37$. In sum, the absence of feelings of guilt at time 1 was associated with more selfish offers one week later, whereas the presence of guilt feelings was associated with more generous offers one week later.

Discussion

Of primary interest was whether the proportion of individuals giving generous versus selfish offers at time 2 would vary as a function of both: (a) the type of offer made at time 1; *and* (b) whether or not they reported experiencing any feelings of guilt at time 1. Consistent with predictions, the results of Study 2 revealed that the vast majority of individuals who reported *feelings of guilt* after negotiating a selfish division of the money switched strategies one week later and made a more generous offer to the same negotiation partner. By contrast, the majority of individuals who made a similarly selfish offer, but reported *no feelings of guilt*, continued pursuing this strategy (selfishness) one week later. These findings are consistent with the idea that the negative affective state associated with guilt can provide information about the long-term costs of selfishness in a repeated social bargaining game. As a result, individuals who experienced feelings of guilt after proposing a selfish offer at time 1 may have been motivated to reverse their offer and make a more generous proposal one week later.

These results were obtained even though the relative difference between selfish and generous offers was subtle and the reported intensity of guilt feelings was low. The fact that these emotion effects were observed even with such low levels of self-reported feeling states leaves open the possibility that it is not just the intensity of affective feelings that motivates appeasement behaviour; it may be that the mere presence or absence of the accompanying cognitive ‘‘guilt’’ schema can moderate cooperation. In regard to the subtle differences between selfish and generous offers (on average only \$1 separated selfish from generous offers), many evolutionary analyses of behaviour remind us that, over the long-run, even small advantages or disadvantages can be multiplied into significant effects (Axelrod, 1984).

According to traditional normative models of economic behaviour, decision-makers should represent outcomes in the ultimatum game such that the goal of maximising short-term self interest looms larger than the goal of maintaining a fairness norm (Guth et al., 1982; Hoffman, McCabe, Shachat, & Smith, 1994). Yet, in the typical ultimatum game it is observed that fair offers (proposals to

split the money 50/50) are more common than offers that maximise short-term self-interest (see Thaler, 1992 for a good review). How might this gravitation toward a fairness norm be explained? Although previous research has investigated variables, such as the size of the pay-offs, the effects of learning the parameters of the game, or the social distance⁸ of the players as explanations for these peculiar levels of cooperative behaviour (see Hoffman et al., 1996), the possible strategic role of emotions has yet to be empirically investigated. The results of Study 2 suggest that emotional reactions to transgressions (e.g., violations of a fairness norm) occurring at one point in time can affect negotiation behaviour one week later and steer negotiations toward a fair or even-handed distribution of the resource. An affect-as-information (Ketelaar & Clore, 1997) interpretation of Frank's (1988) commitment model offers one account of how this process might work.

Guilt as information in the repeated ultimatum game

In a repeated ultimatum game, the immediate lure of higher pay-offs to be gained by repeated selfish behaviour may prevent some individuals from conforming to a norm for fairness in the distribution of resources. Thus, we might expect some individuals to attempt to maximise their short-term self-interest by making slightly selfish offers (\$10 for me, \$9 for you) at both times. Although generous offers and selfish offers both depart from the norm of fairness (a 50/50 split of the resource) one expects that the long-term costs of selfishness in a repeated social dilemma are greater than the long-term costs of generosity (Axelrod, 1984; Frank, 1988). This might be the case because an individual who repeatedly violates a fairness norm by taking more than their share is more likely (than an individual who is consistently generous or plays fair) to be punished or excluded from future social exchanges (Cashdan, 1980, 1989). Because the immediate attractiveness of a selfish division of the resource can loom large, one expects, according to Frank's (1988) commitment model, that feelings of guilt experienced after proposing a selfish offer can operate as a strategic information state—representing the future costs of pursuing this strategy—that tugs in precisely the opposite direction, toward generosity (rather than selfishness), at time 2.

The affect-as-information perspective suggests that individuals who feel guilty after proposing a selfish offer at time 1 may be representing their selfish choice as reflecting not only an *immediate* benefit (receiving more money) but

⁸One might wonder whether the lack of anonymity between participants in Study 2 could have affected levels of cooperation, however, the current pattern of results (high frequency of offers clustering around a 50/50 split of the money) are actually quite typical of findings in the Ultimatum game literature (see Guth et al., 1982; Hoffman et al., 1994; Thaler, 1992 for reviews). Perhaps a more reasonable concern is that the social distance between participants is a plausible explanation for why some individuals felt guilty and others did not. Perhaps only individuals who knew their partner well displayed guilt.

also a *future* cost (violating a fairness norm). Thus, if one has been slightly selfish at time 1 (\$10 for me, \$9 for you), the aversive feeling state associated with guilt may motivate the individual to make a more generous offer at time 2 (\$9 for me, \$10 for you) in order to achieve a roughly equal (e.g., fair) split of the resource *averaged across the two transactions*. By virtue of moving the long-term costs of selfish behaviour into the present—in the form of an unpleasant feeling state—the unpleasant affect associated with guilt may serve as a cost against responding to the short range desire to continue pursuing a selfish or non-cooperative strategy in a repeated social bargaining situation (Frank, 1988; Ketelaar & Clore, 1997).

GENERAL CONCLUSIONS

Popular wisdom among social scientists says that “the best predictor of future behaviour is past behaviour”. If one ignored the emotional concomitants of behaviour, this slogan would suggest that the best predictor of future uncooperative behaviour in a repeated social bargaining game would be the occurrence of past uncooperative behavior in that same situation. By contrast, the current data suggest a more complicated picture in which the presence or absence of an emotional reaction to one’s strategy choice can play an important role in determining future behaviour in a repeated social bargaining game. The finding that the guilt manipulation interacted with social motives (e.g., guilt tended to have its largest effect on uncooperative individuals) also suggests that these results are not merely a result of pre-existing individual differences in the tendency to cooperate or defect. Instead, it would appear that guilt actually provoked uncooperative individuals to depart from their “typical” strategy of uncooperative behaviour.

Previous studies of guilt and cooperation have often identified *all* individuals in the transgression condition as feeling “guilty” (e.g., see Regan et al., 1972). The results of the current study 2 suggest that: (1) not all individuals who commit a transgression will report feelings of guilt; *and* (2) that those individuals who report guilt feelings after a transgression behave differently than those who do not report such feelings. In Study 2, for example, the vast majority of the individuals (91% or 11 out of 12) who reported feeling guilty after making a selfish offer, later reversed their behaviour and gave a generous offer at time 2. By contrast, only 22% of the individuals (2 out of 9) who made a similarly selfish offer, but reported *no* corresponding feelings of guilt, reversed their offer (i.e., switched to a generous offer) at time 2. In other words, if one did not take into account the presence (or absence) of guilt feelings, the current results would suggest a 62% cooperation rate among individuals who had previously transgressed (13 out of the 21 individuals), clearly an underestimate (in this sample) of the amount of cooperation observed as a function of guilt feelings.

One alternative interpretation of the current findings that can be ruled out is that it is not emotion *per se*, but rather pre-existing individual differences in endorsement of fairness norms that account for these data. One version of this explanation would suggest that it is only those individuals who have the strongest endorsement of fairness norms (cooperative individuals?) who are more likely to return to their usual “fair” behaviour over the long run if they deviate from this norm in the short-run. According to this alternative explanation, self-reports of guilt simply identify those individuals who have deviated from their “norm”, presumably the very same individuals who are more likely to return to this norm in the future. This is a sort of “regression to the mean” explanation. Because uncooperative behaviour is atypical for these individuals, they are likely to return to their more typical (i.e., cooperative) behaviour at the next opportunity. Guilt, according to this explanation, is not providing information about the costs of non-cooperation, it is simply a benign byproduct of having identified that your action violates your typical behaviour.

This interpretation could be seen as a viable explanation for the greater levels of cooperation in Study 2, if it were not for the results of Study 1. In Study 2, guilt was associated with greater cooperation (at time 2) among individuals who had committed a single transgression at time 1 (i.e., behaved selfishly). Thus, their behaviour is consistent with the idea that their “typical” behaviour is cooperation and they simply return to their typical (e.g., cooperative) behaviour at the next opportunity (one week later). However, in Study 1, guilt was also associated with greater cooperation among individuals who displayed a general tendency toward uncooperative behaviour, as manifest across the first 40 trials of the prisoner’s dilemma. For these individuals, uncooperative behaviour (rather than cooperative behaviour) appears to be their “norm”. Thus, in the light of Study 1, it would be difficult to claim that individuals who are generally uncooperative (remember that they displayed lower levels of cooperation across the first 40 trials) are simply returning to their (uncooperative) norm by behaving cooperatively during the first set of 10 trials in the second round of play. When the results of both studies are taken together they suggest that guilt does not operate merely as a sort of “wake up call” which provokes the individual to return to their more typical behaviour. Instead, it appears that guilt can also motivate uncooperative individuals to behave *contrary* to their typical behaviour.

Why would an individual deviate from a strategy of pursuing immediate rewards in favour of adopting a strategy that is geared more towards long-term material advantage? One possibility is that uncooperative behaviour can be associated with an immediate cost—in the form of an aversive affective state—that provokes individuals to be less inclined to continue pursuing this strategy (Frank, 1988; Ketelaar & Clore, 1997). Because the aversive feeling state associated with guilt can serve as a “cost” or “punishment” for violating the social norm of cooperation, knowing whether an individual has behaved

“uncooperatively” *and* whether they have experienced feelings of guilt can be informative in predicting future behaviour. In this sense, *past uncooperative* behaviour—in conjunction with feelings of guilt—can, paradoxically, be predictive of *future cooperative* behaviour.

Why do only some uncooperative people feel guilty?

The results of Studies 1 and 2 clearly show that guilt can play a mediating role in cooperation, but the question remains as to why only some uncooperative individuals felt guilty in Study 2? Previous research has shown that there are stable individual differences in the susceptibility to negative affect in general (Gross, Sutton, & Ketelaar, 1998; Larsen & Ketelaar, 1991) and to guilt in particular (Tangney, 1990, 1991). In the context of repeated social bargaining games these individual differences could either be a source of noise in rational decision making or they could reflect the strategic role of emotion in social information processing (for reviews, see Elster, 1996; Frank, 1988; Ketelaar & Clore, 1997). Yet, the obvious question emerges, if guilt plays a strategic role in motivating cooperation, why doesn't everyone feel guilty when they fail to cooperate? An interesting possibility to explore in future research would be the notion that individual differences in guilt feelings are not simply “noise”, but instead reflect the employment of coexisting strategies of non-cooperation (“short-term defection” *indicated by the presence of guilt feelings* after defection and “continual defection” *indicated by the lack of guilt feelings* after defection). This interpretation is consistent with the game theoretic determination that although selfish behaviour may constitute a “rational” strategy in a single shot ultimatum game, in many repeated social bargaining games (including the repeated ultimatum game) there is often no single strategy that can be considered the “optimum” (see Hirshleifer, 1999 for a good review). It may be the case that in social bargaining contexts where multiple optimal strategies (e.g., multiple equilibria) exist, that various sets of complementary strategy mixtures may coexist. For example, it may be the case that a certain percentage of short-term defectors can coexist with a certain percentage of continual defectors and cooperators in a sort of frequency dependent fashion⁹.

⁹ Frequency dependence refers to conditions where the success of a particular strategy depends on its relative frequency in the population compared to alternative strategies. For example, the sex ratio in humans is believed to be frequency-dependent, in the sense that the success of one strategy, say male, is dependent on the proportion of alternative strategists (females) in the population. In some cases, the frequency dependence can lead to an evolutionarily stable ratio of strategies, as in the 50/50 sex ratio observed in humans. Although a particular mixture of strategy may not be completely stable, in an evolutionarily stable strategy sense, it may be relatively stable and capable of existing in the population for a period of time until a different complementary strategy mixture emerges. Some game theoreticians have argued that this scenario may be common in repeated games where multiple equilibria exist (for a review, see Hirshleifer, 1999).

This scheme is reminiscent of the cowboy movie typology¹⁰ of the “good”, the “bad”, and the “ugly”; where the *good* initially tend toward generosity and feel no guilt, the *bad* initially tend toward selfishness but remit when they experience feelings of guilt and the *ugly* tend toward selfishness and experience no guilt feelings to discourage them from continuing this strategy. Finally, individual differences in feelings of guilt might simply arise as a function of the “social distance” between participants (Hoffman et al., 1996). In Study 2, individuals interacted with a classmate from an ongoing course. Perhaps individuals who transgressed against a “close” friend were more likely to experience feelings of guilt than individuals who transgressed against a mere acquaintance.

Affect as information in social interactions

Perhaps emotions so often intrude in our most important social decisions precisely because the affective feeling component accompanying each emotion is so immediately salient and unignorable. After all, experiencing a pleasant or unpleasant feeling state is, by definition, a large part of what it means to have an emotional experience (Clore, 1994). This view suggests that because feeling states are so perceptually overwhelming, emotional states can serve as “psychological stand-ins” for future consequences (costs and benefits) of one’s current situation (see Ketelaar & Clore, 1997; Ketelaar & Todd, 2001; Ketelaar, 2002; Tooby & Cosmides, 1990). This interpretation is compatible with Frank’s (1988; see also Hirschleifer, 1987) claim that emotions function, in part, to provoke individuals to make binding commitments to behave in ways that run contrary to their immediate self-interests. Perhaps in the future game-theoretic, evolutionary, and social-cognitive approaches to the study of emotion can be combined to demonstrate empirically and theoretically how *emotional reasoning* that appears foolish and irrational in the short-run can sometimes be quite functional in the long-run. In this light, the current studies represent a step toward a fuller understanding of the informative functions of emotion in social decision-making.

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¹⁰ Tangney (1991) proposes a similar typology of: *good* (cooperation with no feelings of guilt or shame), *bad* (non-cooperation with feelings of guilt), and *ugly* (non-cooperation with feelings of shame) response styles. The current use of this tripartite typology is slightly different in that it focuses more on the differences in decision strategies (cooperation vs. non-cooperation) as a function of the *presence or absence* of a particular emotion (guilt), rather than focusing on differences in the *quality* of emotional experiences (shame vs. guilt) produced after a transgression.

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