Predictable and Predictive Emotions: Explaining Cheap Signals and Trust Re-Extension

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Abstract

Despite normative predictions from economics and biology, unrelated strangers will often develop the trust necessary to reap gains from one-shot economic exchange opportunities. This appears to be especially true when declared intentions and emotions can be cheaply communicated. Perhaps even more puzzling to economists and biologists is the observation that anonymous and unrelated individuals, known to have breached trust, often make effective use of cheap signals, such as promises and apologies, to encourage trust re-extension. We used a pair of trust games with one-way communication and an emotion survey to investigate the role of emotions in regulating the propensity to message, apologize, re-extend trust, and demonstrate trustworthiness. This design allowed us to observe the endogenous emergence and natural distribution of trust-relevant behaviors, remedial strategies used by promise-breakers, their effects on behavior, and subsequent outcomes. We found that emotions triggered by interaction outcomes are predictable and also predict subsequent apology and trust re-extension. The role of emotions in behavioral regulation helps explain why messages are produced, when they can be trusted, and when trust will be re-extended.

Keywords: emotion, cheap signal, promise, apology, trust game, reciprocity, experiment

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1. Introduction

In this paper, we explore the role of positive emotions (pride, believability, appreciation, contentment, cheerfulness, happiness) and negative emotions (guilt, shame, anger, disgust, aggravation, frustration) in regulating cheap signaling, trust re-extension, and trustworthy behavior in the wake of a *veiled* trust-based interaction between strangers with no explicit indication of certain expectation for repeated interaction.[1] Interactions with strangers have presented recurrent adaptive problems over the course of human evolutionary history (Fehr & Henrich 2003) and are common in modern society, especially in global markets (Nowak & Sigmund 2005; Seabright 2010). Sometimes unexpected opportunities for repeated exchange with previously cooperative or uncooperative partners arise.[2] Once exchange histories establish, partners with mutually beneficial non-binding agreements often reap gains from iterated trust-based trade with one another (e.g., see Cochard, Nguyen Van & Willinger 2004; Boero et al. 2009; Kaplan et al. 2012). However, investors ceding resources (in anticipation of desired

[1] A number of other behavioral economic studies have also used veiled designs where interacting participants are unaware of opportunity for repeated interaction(s) that will later be made available (e.g., see Binmore, Shaked & Sutton 1985; Burnham, McCabe & Smith 2000; Ellingsen et al. 2010; Gambetta & Szekely 2014). Ellingson et al. (2010, p.96) discuss why the veiled design avoiding deception by *commission* does not violate the non-deception norm in behavioral economic experiments and why withholding procedural information may serve to limit undesirable experimenter demand. Nevertheless, because there is no clear agreement among economists as to what kinds of deception are taboo (see survey results by Krawczyk 2013 and discussion by Wilson 2014), deception by *omission* remains a potential concern with our design. Veiled designs may create negative externality in that the next time participants return to the laboratory to participate in other studies, they may question whether they should anticipate unannounced tasks or interactions, unless the instructions explicitly exclude such a possibility (see also Davis & Holt 1993, pp. 23-24; Wilson 2014). It is unlikely that our design produced these externalities, however, as we followed the procedural norm for conducting research with our participant pool by specifying the expected session duration, making a clear statement about the experimental game which was the final one in the session, and indicating when payments would be issued. We discuss in the design section how future studies using veiled designs can make improvements over ours to avoid omitting important details – namely, whether subsequent tasks are scheduled as part of the session.

[2] While transactions with strangers may have been full of danger, mistrust, and exploitation for much of human evolutionary history (Diamond 1997; Bowles 1998), at least more recently, since the 19th century, as modern market society and per capita income have grown (Clark 2007), the norm of exchange has moved from more exclusively personal to more anonymous (North 1990). Market proliferation, in turn, has reinforced learning of the notion that trust in strangers brings benefits, resulting in greater trustworthiness (Zak & Knack 2001; Henrich et al. 2001, 2010; Al-Ubaydli et al. 2013).

returns) remain subject to various kinds of exploitation by previously trusted partners. Partners who demonstrated trustworthiness in the past might subsequently engage in Machiavellian manipulations (Humphrey 1976; Byrne & Whiten 1988) by sending false signals about intentions to engage in future trustworthy behavior. Upon being re-extended trust, these previously trusted partners can opportunistically exploit their positions.[3] Alternatively, if a partner was previously untrustworthy (e.g., breaking a promise and not returning profits on investment) but claims to have intentions and propensity for future trustworthiness, an investor must decide whether to forgo potential gains from future trust-based exchange (by not re-extending trust) or else pursue the available opportunity with that previously untrustworthy partner, at the risk of being repeatedly deceived or exploited.[4] While much attention has been given to the production and evaluation of cues and signals affecting novel trust extension, less attention has been given to the dilemma of trust re-extension and the role of emotions in regulating relevant behaviors.

The ability to integrate evaluations of reputation from cues and signal quality, infer a partner's propensity towards future trustworthiness, and accordingly regulate trust re-extension would have been a highly advantageous trait over the course of human evolutionary history and should continue to be in modern economies. Evolutionary theories of emotions (Tooby & Cosmides 1990; Nesse 1990; Haselton & Ketelaar 2006; Tooby et al. 2008; Schniter & Shields 2013) have proposed that key emotions have been selected to assist us in accomplishing these tasks. We test the propositions that new information about trust-based interaction outcomes triggers emotions, and that, when experienced, these emotions regulate re-affirmative and remedial behaviors, and the propensity to re-extend trust.

[3] McNally and Tanner (2011) speculated that under conditions of "an unforgiving Machiavellian society", one-shot cooperation is most likely to evolve.

[4] As suggested by the phrase "…fool me twice, shame on me", there may be stronger hedonic costs to being a targeted victim of repeated deception, than are experienced after being a first-time victim.

Consistent with "recalibrational" theories of emotions (Tooby et al. 2008; Schniter & Shields 2013; Schniter, Sheremeta & Shields 2014), we propose that emotions integrate new information about trust-based interaction outcomes, providing hedonic feedback that people experience as either *positively* valenced (pleasantly motivating continuation of prior behaviors associated with its occurrence) or *negatively* valenced (unpleasantly motivating disengagement and pursuit of alternative strategies). This positive or negative emotional feedback is designed to motivate changes to behavioral propensities so as to enhance success in future relationships characterized by similar cooperation dilemmas. For example, when a trust-based relationship has been developed and assured, good feelings such as *pride* and *appreciation* are experienced (Schniter & Shields 2013; Schniter, Sheremeta & Shields 2014). As a result, proud trustees may be more inclined to re-affirm the good relationship and demonstrate more trustworthiness (e.g., see Nesse 1990; Fessler 1999, 2001), and appreciative or grateful investors may be more likely to trust the trustee's cheap signals and re-extend trust (McCullough et al. 2001; Dunn & Schweitzer 2005; Algoe, Haidt & Gable 2008; Hirshleifer 1987; Tooby & Cosmides 2008). Alternatively, when a trustee has demonstrated untrustworthy behavior (breaking a promise or exploiting an investor) the investor may experience anger and frustration (e.g. see Ortony, Clore & Collins 1988; Dunn & Schweitzer 2005) while the trustee experiences guilt, and shame (e.g. see Ketelaar & Au 2003; Baumeister, Stillwell & Heatherton 1994; Smith, Webster & Eyre 2002; Sznycer 2010, Sznycer et al. 2012). Angry and frustrated investor's may be more likely to distrust subsequent promises or offers from the untrustworthy trustee (e.g., see Dunn & Schweitzer 2005; Pillutla & Murnighan 1996), and more likely to impose costs or restrict benefits (e.g., see Sell, Tooby & Cosmides 2009). A guilty or shameful trustee may be motivated to make remedial efforts (e.g., issuing a persuasive message or apology) targeting the

affected investor – especially when there is possibility of future trust-based exchange opportunity with this potentially angry investor (e.g. see de Hooge, Zeelenberg, & Breugelmans 2011; Fessler 2001; Sznycer 2010; Sznycer et al. 2012). Apology has been demonstrated to be a particularly effective remedial signal that encourages a victim to trust again by expressing responsibility for an offense and possibly the promise of forbearance, an offer of condolence, or repair (Scher & Darley 1997; Ho 2012; Fischbacher & Utikal 2013; Schniter, Sheremeta & Sznycer 2013).

To study the predictors of emotions and the effects of emotions on spontaneous messaging and trust re-extension, we conducted a non-deceptive study wherein financially motivated participants used endogenously created and naturally distributed promises and messages. Our study is based on a version of the "investment game" by Berg, Dickhaut & McCabe (1995). In our experiments trustees made non-binding promises of investment-contingent returns, then investors decided whether to invest, and finally trustees decided how much to return. Since investing money is risky, investments are usually interpreted as trust. Likewise, because voluntary returns are costly to trustees, the delivery of promised returns on investment (*ROI*) is interpreted as evidence of trustworthiness. We also administered a 20 item survey in which participants reported their emotional status as a consequence of the decisions and interaction outcomes that they just experienced.[5] After an unexpected second game was announced, but before it commenced, trustees could send a one-way message. This design

[5] In this study we focus on 12 emotions that had previously been shown to be affected by trust-based exchange outcomes (Schniter & Shields 2013; Schniter, Sheremeta & Shields 2014). However, to avoid demand effects that might result by focusing participants only on the 12 emotions of interest to our study, and to limit post-rationalization that might result from inducing a more limited focus, we presented subjects with a larger number of 20 emotions. This set of 20 emotions is frequently used in versions of the one-dimensional Positive and Negative Affect Scale (PANAS), a self-report measure of positively and negatively valenced affect state activations developed by Watson, Clark & Tellegen (1988) that has been demonstrated across large non-clinical samples to be a reliable and valid measure of these states (Crawford & Henry 2004).

allowed us to observe the endogenous emergence and natural distribution of trust-relevant behaviors, consequent emotions, and focus on these emotions' effects on trustees' naturally occurring communication strategies, investors' trust re-extension, and trustee's trustworthiness.

While results on the observed frequencies of game behaviors in both trust games of this study are reported in the *Journal of Economic Behavior and Organization* (Schniter, Sheremeta & Sznycer 2013), we did not previously examine the role of emotions. In this paper we evaluate reports of emotions and their role in regulating behaviors relevant to the dilemma of trust re-extension.

2. Background

Despite normative predictions, trust is often developed in experimental one-shot environments with unrelated strangers (e.g., see Dawes & Thaler 1988; Kiyonari, Tanida & Yamagishi 2000; McCabe, Rigdon & Smith 2003; Krasnow et al. 2013), especially when facilitated by cheap talk and emotions (Gambetta & Székely; McElreath et al. 2003; Frank 1988, 2004; Schweitzer, Hershey & Bradlow 2006; Ben-Ner & Putterman 2009; Ben-Ner, Putterman & Ren 2011; Sheremeta & Zhang 2014). When taking into account the observation that people exist and have long existed under the uncertain but ever present shadow of possible future interactions with others, the propensity to trust (despite hazards for opportunism) may bring net exchange benefits.[6] Under such conditions natural selection may have favored those with the propensity to cooperate even when exposed to indicators that interactions were one-shot and interaction partners were unknown (Delton et al. 2011; Krasnow et al. 2013). Sayings like "you always meet twice in a lifetime", "you haven't seen the last of me", and "dangerous enemies will

[6] Human psychological adaptations for sociality likely evolved under a selective regime characterized by repeated interactions among known others (Kelly 1995).

meet again in narrow streets" seem to provide justification for the human tendency to treat others as if they will be beneficial exchange partners or threats in the future, despite the absence of cues assuring there will be repeated interaction. The one-shot investment game (Berg, Dickhaut & McCabe 1995) that models the opportunity to develop and allocate gains through exchange, has shown time and again that people exposed to one-shot sequential exchange opportunities with anonymous others tend to behave in a mutually beneficial way (for reviews see Ostrom & Walker 2005; Balliet & Van Lange 2012) despite the normative proscription from game theory: do not cooperate because your partner will not cooperate.

In the absence of information about past behavior, "cheap" messages (bearing little in the way of up-front costs for production) are often sent to receivers with the intention of communicating information about the sender (e.g., see Farrel & Rabin 1996). For example, non-binding promises (of intended trustworthiness) have been shown to increase cooperation (Rubin & Brown 1975; Kerr & Kaufman-Gilliland 1994; Ellingsen & Johannesson 2004; Charness & Dufwenberg 2006; Sutter 2009). Where demonstrated behavior has informed investors of a trustee's untrustworthiness, messages may be sent with the intention of persuading investors that the trustee is more trustworthy than inferred from cues alone. Many find it quite puzzling that so-called "cheap signals" can effectively be used to negotiate trust between individuals with conflicting interests (Lachmann, Számadó & Bergstrom 2001) and that it is even possible for promise-breakers to rebuild damaged trust by issuing apologies (Schniter, Sheremeta & Sznycer 2013). Below we review why trust can be built with the help of cheap-to-produce messages and why those who re-extend trust to previously untrustworthy individuals (e.g., to promise breakers) may take their messages into consideration.

Cheap-to-produce messages can maintain their reliability because they often end up being "costly" after being used to deceive (Schniter, Sheremeta & Sznycer 2013). Through reputational sanctions or exclusion from future interactions, receivers of deceptively used cheap signals can impose ex post costs greater than the benefits initially derived from deceptively using those signals (Rohwer 1977; Masclet et al. 2003; Schweitzer, Hershey & Bradlow 2006) – thereby maintaining signal reliability in the society in which it was used.

Though it has been studied little, it is reasonable to expect that the psychological machinery designed to produce and evaluate cheap signals is attuned to the experience and perception of emotions. Emotions are important components of message composition, speech production and perception, and face-to-face communication. Personal communication in various forms is known to improve cooperation (Orbell, Dawes & Kragt van de 1988; Bohnet & Frey 1999; Ridings, Gefen & Arinze 2002; Zheng et al. 2002; Buchan, Croson & Johnson 2006; Cason, Sheremeta & Zhang 2012) by facilitating coordination, decreasing social distance, raising solidarity, and providing the cues of familiarity that are normally associated with trustworthy relationships. Adam Smith (1759) wrote of the "fellow feeling" that can be generated, for example as a consequence of sharing in another's emotional state, and being part of the process of improving it. According to Smith, the capacity to experience the pleasurable "fellow feeling" is based on our ability to model another's circumstances and emotional reaction to them, and to internally simulate (sympathize with) the emotional feelings that they might derive. When messages are produced[7], they are often assembled with verbiage meant to demonstrate regard for the recipient, persuade a change in the recipient's perspectives, and provide information of the

[7] Messaging is often an option (i.e., not compulsory). When optional, we expect people to tradeoff costs and benefits. Messaging may *not* be chosen for a variety of reasons including: to minimize cognitive effort, in an attempt to manage impressions, to save time, to pursue alternative opportunities that otherwise might be forgone.

signaler's intentions and emotional experiences: things which may not be otherwise known (Pennebaker & Graybeal 2001). Though the messages we consider guarantee no honest information, their length is a potential indication of the effort invested into an attempt to communicate these potentially unknown things. On the other hand, where messages are intended as re-affirmations of known things (e.g., recent cooperation), their length is not as necessary. Thus to understand the human ecology of cheap signal production and evaluation, one should also understand the dynamic triggering of emotions and their targeted effects on the propensity to engage in communication.

According to the recalibrational theory of emotions, when evolved psychological machinery has computationally identified adaptive problems resulting from social dilemma outcomes, emotional responses are triggered that encourage recalibration of behavior regulation programs (Schniter & Shields 2013; Schniter, Sheremeta & Shields 2014). As such, emotions are hedonic components of a learning system that integrates relevant experiences to inform individual decisions and interaction behaviors. Emotions are often relatively "automatic", difficult to control, and distinct from cogitative non-emotional learning. When triggered, emotional responses produce sudden physiological changes (e.g., arousal) and affect facial expression, posture, subjective experience and perception, and action tendencies (Frijda 1986; Tooby & Cosmides 1990).

Emotionally affected speech and facial expression have long been believed to have some "honest signal" features revealing underlying emotional states (Darwin 1872). A century after Darwin, researchers began making a strong case that basic human emotions are not only universal in their distinct facial and vocal expressions, but also that the identification of these emotions exists and is consistent across humans. Evidently, humans can accurately recognize

many basic emotions (e.g., happiness, surprise, sadness, fear, disgust and anger) across quite different cultures in faces (e.g., Ekman, Sorenson & Friesen 1969), voices (Bryant & Barrett 2008; Sauter et al. 2010), and written messages (Xiao & Houser 2005) supporting the notion that these communicative forms provide fairly reliable indicators of the positive and negative affect, if not actual emotion, that the sender experiences (Keltner & Kring 1998) and that a reduction in ambiguity has been selected for in human emotional signaling (Searcy & Nowicki 2005). Hirshleifer (1987) and Frank (1988, 2004) proposed that emotions provide information about people's behavior propensities (e.g. as guarantors of promises) because they work as commitment devices. As veridical signals, emotions appear to be sufficiently reliable in this capacity; emotional displays are more often than not involuntary and high levels of emotional expressivity are difficult to imitate (Boone & Buck 2003; Schug et al. 2010). Thus, the standard human ecology in which "cheap" signal production and evaluation was designed to operate is not entirely costless. Rather, because the signaling of emotional states is often veridical, language should be evaluated and trusted according to its correspondence with emotional propensities. Under these conditions, detection of deceptive language production would lead to the imposition of more costs than benefits on the signaler – effectively making cheaply produced language in the context of displayed emotions a "costly signal".

We anticipated that, despite the anonymity we guaranteed participants in our laboratory implementation of the trust game (i.e., ensuring that their partners would not personally identify or watch them), experiences of emotions would be reliably produced and recognized by those experiencing them.[8] We evaluate the reported experience of several emotions (appreciation,

[8] Schniter, Sheremeta & Shields (2014) also collected data on emotional reactions to trust-based interaction outcomes using an emotional status survey with multiple emotion items. They reported floor effects with some of their items: where participants indicated experiencing the emotion very little or not at all. However, other emotions

contentment, cheerfulness, happiness, pride, believability, anger, disgust, aggravation, frustration, guilt, and shame) and whether these emotions predict the use of cheaply produced messages, trust re-extension, and trustworthy or opportunistic behavior. Below we hypothesize that these emotions serve the recalibrational functions outlined in Schniter and Shields (2013), and detail specific predictions about the triggering of these emotions and how experienced emotions will correlate with subsequent behaviors. Previous studies have shown that the experience of emotions affects subsequent game behavior (Capra 2004; Pillutla & Murnigham 1996; Fehr & Gachter 2002; Ketelaar & Au 2003; Dunn & Schweitzer 2005; Hopfensitz & Reuben 2009; Kausel & Connolly 2014). The current study contributes to this literature by examining how trust-relevant integral emotions are naturally triggered by interaction outcomes and how they inform trust repair and re-extension in subsequent interactions after trust is damaged.[9]

3. Experiment Details and Hypotheses.

3.1. Experiment Details

Our research was approved by Chapman University's internal review board for research with human subjects and informed consent was obtained from all participants. The research was

in their study showed strong responsiveness to trust-game outcomes, and based on those results they suggested that future researchers consider investigating appreciation, happiness, pride, frustration, anger, and guilt: a selected set with balanced valance that is representative of the varieties of functions described by their recalibration model of emotions in trust-based interaction. We chose to study those six emotions in addition to another six which we expected to be roughly synonymous and therefore similarly activated: cheerfulness (often concomitant with appreciation), contentment (often concomitant with happiness), believability (often concomitant with pride), aggravation (often concomitant with frustration), disgust (often concomitant with anger), and shame (concomitant with guilt when the offender's culpability is known).

[9] A few neuroeconomic studies have shown evidence of neural correlates of interaction behaviors in ultimatum games (Sanfey et al. 2003) and trust games (Aimone, Houser & Weber 2014) that may correspond to emotional experiences (e.g., see Takahashi et al. 2004) but have not provided direct measures of whether emotions were actually experienced. Because physiological measures are often incapable of detecting social emotions (Adolphs 2002), self-reports may provide the best, if not only, direct measures of social emotions (Hopfensitz & Reuben 2009).

conducted at Chapman University's ESI laboratory. 458 participants (229 pairs) were recruited from a standard campus-wide subject pool for participation in a session that could last up to 45 minutes. There were 25 sessions. Each session had between 10 and 24 participants. The average earnings from experiments were $18, ranging from a $0 to $40, plus $7 for arriving to the session on time and participating. No participant participated more than once, and no participant had prior experience with a similar game environment. During a session, participants seated at visually isolated cubicles interacted with each other anonymously over a local computer network. Our procedure consisting of three parts, lasted an average of 35 min total, did not involve deception,[10] and proceeded as follows. Upon arrival, participants were told that they would receive $7 for participation, to be paid at the end of the session along with any additional money made during the session.

In the first part of the session, participants received instructions (see Appendix A) for and interacted in an "experiment": a *veiled* trust game with (i) no indication of a subsequent game to follow and (ii) no statements that the session would end at conclusion of that game. The first trust game is denoted as 'veiled' because participants are intentionally not informed of a subsequent "repetition of the experiment": a trust game (repeated with same roles and partners as

[10] Though we failed to provide information at the outset of our session indicating our intent to provide a repeated trust game opportunity, our procedure does not qualify as the more typical form of experimental deception (e.g. *by commission* of lies or exaggerations). In an effort to neither mislead nor coerce individuals, participants were made aware that their participation was voluntary and that they could stop participating at any time, we provided participants a reasonable indication of expected total duration for the session to which they were recruited, and we made no misleading or counterfactual statements. Nevertheless, future studies using similar veiled approaches can improve on our design by more explicitly clarifying from the outset that a multi-stage approach is planned. As suggested by the editor, a veiled design could avoid use of the word "experiment" in describing a single stage and more transparently explain to participants something like, "The session consists of three stages. You will receive now the instructions of stage 1. After completion of stage 1, there will be a stage 2 for which you then will receive a new set of instructions. Finally, following completion of stage 2 there will be a final stage 3 for which you will receive a new set of instructions."

before) that would follow in part three.[11] Participants were assigned to one of two roles: "Participant A" (investor), or "Participant B" (trustee). First, the trustee completed the following standardized statement (which we will refer to below as a promise) by selecting an integer from 0 to 20: "I (Participant B) promise to transfer back $\$___$of my income to you (Participant A) if you choose IN". This statement was not binding, however. That is, the trustee was not obligated to transfer back the amount promised to the investor, and both trustee and investor knew this. The computer conveyed the trustee's statement to the investor and then the investor chose either OUT or IN. If the investor chose OUT, she received $5 and the trustee $0. If the investor chose IN (invest), then the trustee received $20 (the "income"), after which he selected a whole dollar amount from $0 to $20 to send back to the investor.

In the second part of the session, after the veiled trust game (game 1) finished, participants were given an emotional status survey (see Appendix B) that asked them to report how much they felt each of 20 emotional states (on a five point scale labeled (1) very slightly or not at all, (2) a little, (3) moderately, (4) quite a bit, (5) extremely) as a consequence of their recent game interactions and outcomes.[12] The computer software presented all emotional states on one screen and in random order.

In the third part of the session, after completing the survey, we gave our participants additional instructions (see Appendix A) indicating that they had opportunity to participate in a "repetition of the experiment". These instructions unveiled that in game 2, participants would

[11] We were motivated to see how people deal with trust re-extension dilemmas that were not explicitly anticipated as a consequence of certain expectations (for repeated interaction) but arise through a surprise unveiling. This required us to first examine trust-based interaction behaviors carried out by procedurally naïve individuals from behind the veil of ignorance.

[12] Of the 20 emotions surveyed, we later focus predictions and analyses on a positive subset (appreciation, contentment, cheerfulness, happiness) and a negative subset (anger, disgust, aggravation, frustration) among investors (who might have been benefited or exploited and had their trust assured or damaged), and a positive subset (pride, believability) and a negative subset (guilt, shame) among trustees (who might have been beneficent or opportunist and kept or broken their promises).

remain in the same roles and interact with the same partner as in game 1. The instructions also indicated that prior to game 2, the trustee would have an opportunity to use a "message" box to send a one-way message to the investor. Trustees were told that "in these messages, no one is allowed to identify him or herself by name, number, gender, or appearance," but that other than these restrictions, trustees could "say anything in the message." If trustees wished not to send a message they were instructed to "simply click on the send button without having typed anything in the message box." The computer conveyed the trustee's message and subsequently the standardized promise to the investor, and then game 2 proceeded. We specified that game 2, which had the same rules as game 1, was the last experimental game in the session.

We classified whether messages from our study were *apology* (or not) using an incentivized laboratory coordination game (Houser & Xiao 2011). Three coders recruited from the subject pool and blind to the hypotheses[13] were asked to code each message based on whether or not it conformed to a broad definition of apology ("an explicit or implicit acknowledgment of offense"). All messages without content were coded by all coders as not conforming to the definition of apology and 93% of messages with content were coded by the majority of coders as conforming to the definition, a "substantial" inter-coder agreement (Kappa of 0.70).[14]

[13] The instructions for coders, details about how they were paid, and their earning from the incentivized task are reported in Schniter, Sheremeta, and Sznycer (2013).

[14] We use a standard approach from content analysis methodology to calculate Cohen's Kappa inter-rater agreement coefficient (Cohen 1960; Krippendorff 2004). Kappa values between 0.41 and 0.60 are considered "Moderate" agreement, and those above 0.60 indicate "Substantial" agreement (Landis & Koch 1977).

3.2. Hypotheses

An earlier publication in the *Journal of Economic Behavior and Organization* (Schniter, Sheremeta & Sznycer 2013) detailed behavioral results from games 1 and 2 of this study, with particular attention to the effects of promises, transfers, messages, and apologies. This earlier publication did not examine the role of emotion experiences as a result of these games and gave less attention to the unanticipated dilemma of trust re-extension that we focus on here.

When deciding whether to re-extend trust, it is important for an investor to obtain accurate information about the propensity of trustees to behave in a trustworthy manner. The integrity of a trustee's previous promise (i.e., its *signal value*) and the actual returns made on investment (*ROI*) are verbal and non-verbal indicators, respectively, of trustworthy character (demonstrated in past word and action). Previous studies suggest that verbal and non-verbal indicators of trustworthiness may have separate effects on subsequent trust extension (Schweitzer, Hershey & Bradlow 2006; Schniter, Sheremeta & Sznycer 2013), so we examine them as independent variables. We hypothesize that these verbal and non-verbal demonstrations of trustworthy character trigger distinct sets of emotional reactions in investors and trustees facing particular problems and that the emotions better calibrate them for repeated interaction with one another.

Specifically, we predict that when the *signal value* (= return – promise) of trustworthiness is negative, the trustee's psychology implicitly recognizes potential for a subsequent *promise breaker*'s (*promise keeper*'s) cooperation problem and triggers an emotional reaction: lower (higher) levels of pride and believability, higher (lower) levels of guilt and shame. When the non-verbal indicator of trustworthiness, *ROI* (= return/investment), is greater (not greater) than one, the trustee implicitly recognizes potential for a subsequent *beneficent* (*opportunist*)

cooperation problem and an emotional reaction is triggered: feeling higher (lower) levels of pride and believability, lower (higher) levels of guilt and shame. We expect that together the trustee's *beneficent* (*opportunist*) and *promise breaker* (*promise keeper*) emotional reactions inform the trustee's propensity to produce spontaneous re-affirmative or remedial behaviors (constructing *messages* with content, constructing wordier messages with higher *word count*, and issuing spontaneous *apologies*) in preparation for a subsequent interaction problems.

We predict that when the *signal value* (= return – promise) is negative (positive), the investor implicitly recognizes potential for a subsequent *damaged trust* (*assured trust*) cooperation problem and an emotional reaction is triggered, characterized by higher (lower) levels of anger, disgust, aggravation, frustration, and lower (higher) levels of appreciation, contentment, cheerfulness, and happiness. When *ROI* is greater than one (one or less), the investor experiences a *benefited* (*exploited*) emotional reaction: feeling lower (higher) levels of anger, disgust, aggravation, frustration, and higher (lower) levels of appreciation, contentment, cheerfulness, and happiness.

We expect that the propensity to re-extend trust in game 2 is informed by the investor's emotional reactions to demonstrated trustworthiness, and some assessment of re-affirmative and remedial messaging (e.g., whether or not there is a *message* with content, what the *word count* of message is, whether or not an *apology* was issued) by the trustee after the investor's initial emotional reactions to game 1 interaction outcomes.[15] In Figure 1 we provide a path model

[15] We suspect that investor emotional reactions to trustee re-affirmative and remedial behaviors would also affect our model, however we did not survey emotional reactions to either received messages or game 2 promises and are therefore unable to account for their partial effects. Our model characterizes cooperation problems resulting from certain game interaction outcomes as discrete and binary (e.g. a promise is either *kept* or *broken*), and expects the set of recalibrational emotions they trigger to be distinct (promoting either *re-assuring* or *remedial* messaging, respectively). As such, we evaluate reports of emotional states and behavioral differences between naturally-formed groups (e.g. *promise keeper* vs. *promise breaker* trustees, *beneficent* vs. *opportunist* trustees, etc.) using two-sample (Welch's) t-tests for equal means where appropriate.

visually representing the above predicted relationships between indicators of trustworthiness, emotional reactions to cooperation problems resulting from game 1 interaction outcomes, messaging behaviors, and the trust of re-extension decision. We suspect that investor emotional reactions to trustee re-affirmative and remedial behaviors would also affect our model, however we did not survey emotional reactions to either received messages or game 2 promises and are therefore unable to account for their partial effects.

--- Figure 1 about here ---

In addition to the predicted emotional effects on messaging and trust re-extension summarized above and in Figure 1, we predict emotional effects on trustee behavior in game 2. Specifically, we predict a greater propensity to generate trustworthy indicators (e.g., with higher *signal value* and higher *ROI*) in game 2 among trustees who reported higher levels of emotional reaction to game 1 – regardless of reaction valence (i.e., higher levels of feeling proud, believable, guilty, and ashamed). Conversely, we expect those reporting less emotional reaction to demonstrate less trustworthy behaviors.

4. Results

Trust and reciprocity decisions from this game are reported in detail in Schniter, Sheremeta & Sznycer (2013); however, the role of game outcomes in triggering emotional experiences, and the role of emotional experiences in affecting subsequent behavior propensity was not reported.

4.1. General Overview

We found no significant differences between the twenty five sessions and report the joint results of all 458 participants where appropriate. As seen with similar games, we observed a high initial rate of promised cooperation: 95.2% (218/229) of trustees promised investors $ROI > 1$, 3.9% (9/229) promised $ROI = 1$, and 0.8% (2/229) promised $ROI < 1$. In game 1, there was also a high rate of trust in response to the promises: investors trusted 86.7% (189/218) of trustees promising $ROI > 1$ and 22.2% (2/9) promising $ROI = 1$, but none of those promising $ROI < 1$. Trusting investors from the first game (83.4% of all investors) faced a new set of challenges when they interacted with the same trustees again in a second unexpected game. Some of these investors decided whether to re-extend trust to trustees who cooperated in the first game by delivering a $ROI > 1$ (which 88.5% did), delivering the returns they promised (which 81.2% did), or both. Other investors decided whether to re-extend trust to trustees that did not deliver the returns they promised (18.8% of all trusted trustees), or did not deliver a profitable *ROI* (11.5% of all trusted trustees), or both. A subset of those who decided whether to re-extend trust to non-cooperators, appear to have also been influenced by their emotional reactions to game 1 and subsequent message and apology that were sometimes received.

We examined emotional state reports from the 382 participants who had game 1 interactions where trust was extended. We found moderately high reliability of internal consistency in their emotion reports: the Cronbach alpha coefficient is 0.889 for the 10 item Positive Affect Scale and 0.888 for the 10 item Negative Affect Scale of our 20 item survey, a version of the PANAS (Watson, Clark & Tellegen 1988).[16] There was substantial variability in

[16] Moderately high reliability of internal consistency in PANAS similar to ours has been reported by Watson, Clark and Tellegen (1988) and others (e.g., Mehrabian 1998; Roesch 1998; Kausel & Connolly 2014).

individual reports of the 12 emotional states investigated below.[17] The average reported emotional state had a mean of 2.21 (median = 1, SD = 1.04), near 2 ("a little"). Ratings on every emotional state ranged from 1 ("very slightly or not at all") to 5 ("extremely"). While the modal report for most (7/12) emotional states was 1 ("very slightly or not at all") modes were also seen at 3 for believable and 4 for appreciative, content, cheerful, and happy. Reports of 1 were more frequent for emotional states in the negative set than for the positive set (1968/2292 versus 400/2292, respectively), contributing to significantly lower intensity of reported negative states (M = 1.27, SD = 0.75) than positive states (M = 3.15, SD = 1.34) according to Wilcoxon matched-pairs tests (Z = -15.167, $p < .001$). This pattern of significantly lower reported negative states was observed in both investors (Z = -9.446, $p < .001$) and trustees (Z = -11.798, $p < .001$).

In this paper, we focus on the explanatory power of the emotional reactions we predict based on recalibrational theory. Below we report results indicating the predictable and predictive nature of emotional reactions in this unexpectedly repeated interaction. Emotions help explain whether participants attempted to use cheap signaling reassuringly or remedially, whether investors decided to re-extend trust, and whether individuals were more likely to break promises or benefit their exchange partners.

4.2. Predicted Emotions

4.2.1. *Trustees: Emotions Predicted by Behavior*

In this section we evaluate whether the positive and negative emotional reactions to game 1, reported by naturally occurring groups of trustees and investors, were predicted by demonstrations of trustworthiness (*signal value, ROI*) after being trusted (i.e., invested in). As

[17] We refer to reports of proud, believable, guilty, ashamed, angry, disgusted, aggravated, frustrated, appreciative, content, cheerful, and happy emotional states.

predicted, after game 1, *promise breakers* reported significantly higher levels of guilt and shame than *promise keepers*, and *promise keepers* reported significantly higher levels of pride and feeling believable than *promise breakers*. We provide bar charts of *promise breaker*'s and *promise keeper*'s emotions and report the details of Welch's t-test comparisons for equal means in Appendix C.

Also, consistent with our prediction of a *beneficent* (*opportunist*) emotional reaction in trustees, *beneficent* trustees delivering $ROI > 1$ in game 1 reported significantly higher levels of pride and feeling believable. *Opportunist* trustees reported significantly higher levels of guilt and shame. We provide bar charts of *beneficent* and *opportunist* trustees' emotions and report the details of Welch's t-test comparisons in Appendix C.

--- Figure 2 about here ---

Table 1: Regression of Trustees' Emotions on *Signal Value*

Dependent variable	*Proud*	*Believable*	*Guilty*	*Ashamed*
Specification	(1)	(2)	(3)	(4)
Game 1 Return-Promise	0.116***	0.164***	-0.138***	-0.084***
	(0.031)	(0.028)	(0.016)	(0.012)
Constant	3.429***	3.394***	1.222***	1.110***
	(0.105)	(0.096)	(0.055)	(0.042)
R-squared	0.070	0.151	0.280	0.193
Observations	191	191	191	191

Note: *** significant at 1%. Standard errors in parenthesis.

--- Figure 3 about here ---

Table 2: Regression of Trustees' Emotions on *ROI*

Dependent variable	*Proud*	*Believable*	*Guilty*	*Ashamed*
Specification	(1)	(2)	(3)	(4)
Game 1 Return/Investment	0.709***	0.872***	-0.821***	-0.481***
	(0.185)	(0.173)	(0.097)	(0.076)
Constant	2.137***	1.781***	2.722***	1.992***
	(0.319)	(0.298)	(0.167)	(0.130)
R-squared	0.072	0.119	0.275	0.176
Observations	191	191	191	191

Note: *** significant at 1%. Standard errors in parenthesis.

Figure 2 displays a bubble plot of trustee emotions and *signal value* (the difference between game 1 return and promise). Observations are plotted with bubbles, where the relative size indicates the proportion of observations at a given point. Table 1 reports results of linear regression models where the dependent variable is a specific emotion (proud, believable, guilty, ashamed) and the independent variable is *signal value*. We find that trustee emotions are predicted by *signal value* of the promise.

Similarly, Figure 3 displays a bubble plot of trustee emotions and *ROI*. Table 2 reports results of estimating linear regression models where the dependent variable is a specific emotion (proud, believable, guilty, ashamed) and the independent variable is *ROI*. We find that trustee emotions are predicted by *ROI*. This leads us to our first result:

Result 1: Trustees' demonstrations of trustworthiness in game 1, by *signal value* of promise and *ROI*, predict their subsequent emotions.

4.2.2. *Investors: Emotions Predicted by Behavior*

As predicted, investors with *damaged trust* (where game 1 return < promise) reported significantly higher levels of anger, disgust, aggravation, and frustration while investors who had been *assured* with a return ≥ promise reported significantly higher levels of appreciation, contentment, cheerfulness, and happiness. We provide bar charts of emotions reported by investors with *damaged trust* and *assured trust* and report the details of Welch's t-test comparisons in Appendix C.

Also, consistent with our prediction, significantly lower levels of anger, disgust, aggravation, frustration, and significantly higher levels of appreciation, contentment, cheerfulness, and happiness were reported after game 1 by investors who had *benefited* from a

ROI > 1, as opposed to those *exploited* by lower *ROI*. We provide bar charts of emotions reported by investors who had *benefited* and been *exploited* and report the details of Welch's t-test comparisons in Appendix C.

--- Figure 4 about here ---

Table 3: Regression of Investors' Emotions on *Signal Value*

Dependent variable	*Angry*	*Disgusted*	*Aggravated*	*Frustrated*	*Appreciative*	*Content*	*Cheerful*	*Happy*
Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Game 1 Return-Promise	-0.232***	-0.188***	-0.208***	-0.193***	0.227***	0.209***	0.181***	0.202***
	(0.019)	(0.017)	(0.019)	(0.018)	(0.029)	(0.026)	(0.026)	(0.026)
Constant	1.372***	1.212***	1.290***	1.338***	3.455***	3.550***	3.031***	3.296***
	(0.066)	(0.057)	(0.063)	(0.063)	(0.098)	(0.087)	(0.090)	(0.088)
R-squared	0.432	0.397	0.400	0.365	0.248	0.263	0.200	0.244
Observations	191	191	191	191	191	191	191	191

Note: *** significant at 1%. Standard errors in parenthesis.

--- Figure 5 about here ---

Table 4: Regression of Investors' Emotions on *ROI*

Dependent variable	*Angry*	*Disgusted*	*Aggravated*	*Frustrated*	*Appreciative*	*Content*	*Cheerful*	*Happy*
Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Game 1 Return/Investment	-1.508***	-1.171***	-1.346***	-1.324***	1.615***	1.497***	1.366***	1.422***
	(0.109)	(0.099)	(0.105)	(0.101)	(0.161)	(0.142)	(0.147)	(0.146)
Constant	4.104***	3.341***	3.728***	3.724***	0.553**	0.863***	0.590**	0.738***
	(0.187)	(0.170)	(0.181)	(0.174)	(0.278)	(0.244)	(0.254)	(0.251)
R-squared	0.505	0.425	0.464	0.477	0.346	0.371	0.313	0.334
Observations	191	191	191	191	191	191	191	191

Note: *** significant at 1%. Standard errors in parenthesis. Constants are not reported.

Figure 4 displays a bubble plot of investor emotions and *signal value* of promise. Observations are plotted with bubbles, where the relative size indicates the proportion of observations at a given point. Table 1 reports results of estimating linear regression models where the dependent variable is a specific emotion (angry, disgusted, aggravated, frustrated, appreciative, content, cheerful, happy) and the independent variable is *signal value*. We find that investor emotions are predicted by *signal value* of promise.

Similarly, Figure 5 displays a bubble plot of investor emotions and *ROI*. Table 4 reports results of estimating linear regression models where the dependent variable is a specific emotion (angry, disgusted, aggravated, frustrated, appreciative, content, cheerful, happy) and the

independent variable is *ROI*. We find that investor emotions are predicted by *ROI*. This leads us to our second result:

Result 2: Trustees' demonstrations of trustworthiness in game 1, by *signal value* of promise and *ROI*, predict investors' subsequent emotions.

4.3. Predictive Emotions

4.3.1. *Trustees: Spontaneous Messaging Behaviors Predicted by Emotions*

Using regression analysis, we evaluated the effects of trustees' emotional reactions to game 1 on measures of their spontaneous re-affirmative and remedial behaviors (sending a message with content, the word count sent, and inclusion of a spontaneous apology). Table 5 reports how the likelihood of *message* (i.e., whether or not they sent a message with content) depends on different emotions. We also controlled for the trustee *signal value*, as a broken promise may have been a prime motivator for sending messages with content. Nevertheless, trustees' feelings of pride showed a significant positive relationship predicting *message* (p = .027), explaining 2.7% of variance in *message*. Trustees feeling believable, guilt, or ashamed were not predictive of *message.*

Table 5: Regression of *Message* on Trustees' Emotions

Dependent variable	*Message*	*Message*	*Message*	*Message*	*Message*
Specification	(1)	(2)	(3)	(4)	(5)
Proud	0.300**				0.330**
	(0.136)				(0.146)
Believable		0.184			0.120
		(0.147)			(0.156)
Guilty			0.344		0.562
			(0.310)		(0.429)
Ashamed				0.291	0.029
				(0.402)	(0.539)
Game 1 Return-Promise	-0.052	-0.046	0.028	0.006	0.003
	(0.064)	(0.066)	(0.070)	(0.066)	(0.076)
Constant	0.429	0.800	1.002**	1.090**	-0.761
	(0.465)	(0.513)	(0.405)	(0.474)	(0.845)
R-squared	0.027	0.009	0.008	0.004	0.047
Observations	191	191	191	191	191

Note: ** significant at 5%, *** significant at 1%. Standard errors in parenthesis.

Table 6 reports how the message *word count* depends on different emotions, as well as the trustee *signal value*. We used a hurdle model, described by Cameron and Trivedi (1998), since the process of generating zero values (i.e., no words) is likely to be different from the process of generating positive values. Trustees' pride showed a significant negative relationship ($p < .001$), while feeling believable as well as feelings of guilt and shame showed a significant positive relationship ($p = .010$, $p < .001$ and $p < .001$), with *word count*. Next, we estimated a regression to evaluate the combined effects of the above four emotional reactions on message *word count*. We can reject the hypothesis that all four emotions (specification 5 in Table 6) have no effect on *word count* ($X^2 = 62.20$, $p < .001$, df = 4). As a set, the four emotions predicted 5.5% of the variance in message *word count*.

Table 6: Regression of *Word Count* on Trustees' Emotions

Dependent variable	*Word Count*	*Word Count*	*Word Count*	*Word Count*	*Word Count*
Specification	(1)	(2)	(3)	(4)	(5)
Proud	-0.046***				-0.040**
	(0.015)				(0.017)
Believable		0.042**			0.081***
		(0.016)			(0.017)
Guilty			0.160***		0.206***
			(0.024)		(0.036)
Ashamed				0.132***	-0.064
				(0.031)	(0.045)
Game 1 Return-Promise	-0.035***	-0.047***	-0.016**	-0.028***	-0.023***
	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)
Constant	2.881***	2.575***	2.514***	2.569***	2.386***
	(0.057)	(0.061)	(0.038)	(0.042)	(0.093)
R-squared	0.029	0.027	0.044	0.032	0.055
Observations	191	191	191	191	191

Note: ** significant at 5%, *** significant at 1%. Standard errors in parenthesis.

Next, Table 7 reports logistic regression analyses evaluating the effects of trustee emotional reactions to game 1 on spontaneous *apology*. Trustees' feelings of pride did not show a significant relationship predicting *apology*. On the other hand, trustees feeling believable showed a significant negative relationship ($p = .019$) while feelings of guilt and shame showed a significant positive relationship ($p = .000$ and $p = .005$) predicting *apology*. Next, we estimated a logit model to evaluate the combined effects of the above four emotional reactions on likelihood

of *apology*. We can reject the hypothesis that all four emotions (specification 5 in Table 7) have no effect on the likelihood of apology ($X^2 = 19.56$, $p < .001$, df = 4). The Cox & Snell R^2 indicates that together the four emotions explain 41.8% of the *apology* variance.

Result 3: Trustees' emotions' predict their subsequent messaging behavior such as issuing *messages* with content, with longer *word count*, and with *apology*.

Table 7: Regression of *Apology* on Trustees' Emotions

Dependent variable	*Apology*	*Apology*	*Apology*	*Apology*	*Apology*
Specification	(1)	(2)	(3)	(4)	(5)
Proud	-0.243				0.162
	(0.169)				(0.227)
Believable		-0.437**			-0.342
		(0.187)			(0.235)
Guilty			1.283***		1.371***
			(0.293)		(0.420)
Ashamed				1.081***	-0.193
				(0.389)	(0.493)
Game 1 Return-Promise	-0.407***	-0.366***	-0.291***	-0.346***	-0.262***
	(0.083)	(0.083)	(0.081)	(0.080)	(0.085)
Constant	-1.535***	-0.973*	-4.131***	-3.576***	-3.486***
	(0.576)	(0.589)	(0.544)	(0.551)	(1.119)
R-squared	0.292	0.312	0.405	0.328	0.418
Observations	191	191	191	191	191

Note: * significant at 10%, *** significant at 1%. Standard errors in parenthesis.

4.3.2. *Investors: Trust Re-extension Predicted by Emotions*

In this section we evaluate whether investors' trust re-extension in game 2 was predicted by their emotional reactions to game 1 and by measures of spontaneous re-affirmative or remedial messaging behavior demonstrated after game 1.

Table 8 reports logistic regression analyses evaluating the effects of trustee emotional reactions to game 1 on *trust re-extension* in game 2. We also include one of several measures of messaging behaviors (i.e., *message, word count,* or *apology*) that investors were targeted by, as well as the trustee *signal value* from game 1 and new *promises* (specifically, the returned amount

promised) in game 2. In estimating these models, we do not consider a model with multiple measures of messaging behaviors because it would introduce multicollinearity.[18]

Table 8: Regression of *Trust Re-Extension* on Investors' Emotions

Dependent variable	*Game 2 Investment*	*Game 2 Investment*	*Game 2 Investment*	*Game 2 Investment*	*Game 2 Investment*
Specification	(1)	(2)	(3)	(4)	(5)
Angry	-0.068	-0.113	0.038	0.004	-0.095
	(0.325)	(0.352)	(0.380)	(0.368)	(0.342)
Disgusted	-0.062	-0.002	-0.308	-0.380	-0.230
	(0.360)	(0.386)	(0.415)	(0.441)	(0.418)
Aggravated	0.467	0.709	0.899	0.578	0.507
	(0.516)	(0.566)	(0.599)	(0.566)	(0.562)
Frustrated	-0.858*	-0.929*	-0.934*	-0.695	-0.829*
	(0.471)	(0.490)	(0.516)	(0.491)	(0.504)
Appreciative	0.041	-0.094	-0.077	-0.015	-0.057
	(0.307)	(0.333)	(0.347)	(0.328)	(0.339)
Content	-0.101	-0.088	-0.034	-0.038	-0.016
	(0.321)	(0.327)	(0.353)	(0.335)	(0.344)
Cheerful	0.570	0.526	0.491	0.480	0.545
	(0.375)	(0.382)	(0.403)	(0.385)	(0.395)
Happy	0.013	0.072	0.095	-0.025	-0.019
	(0.416)	(0.431)	(0.436)	(0.439)	(0.432)
Game 1 Return-Promise		0.157*	0.202**	0.165	0.268*
		(0.094)	(0.100)	(0.103)	(0.138)
Game 2 Promise		0.171	0.186	0.155	0.198
		(0.118)	(0.122)	(0.121)	(0.126)
Message			1.994***		
			(0.589)		
Word count				0.053**	
				(0.026)	
Apology					2.635**
					(1.182)
Constant	1.795	0.386	-1.319	0.167	0.237
	(1.230)	(1.584)	(1.748)	(1.664)	(1.714)
R-squared	0.178	0.203	0.288	0.239	0.255
Observations	191	191	191	191	191

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. Standard errors in parenthesis.

We can reject the hypothesis that all eight emotions in specification (1) of Table 8 have no effect on the likelihood of trust re-extension ($X^2 = 21.54$, $p = .005$, df = 8, Cox Snell $R^2 = 0.178$). Overall, it appears that the most important emotion predicting trust re-extension is the experience of frustration. Specification (2) of Table 8 considers these emotions, as well as the trustee game 1 *signal value* and new *promises* in game 2 to predict trust re-extension ($X^2 = 24.06$, $p = .007$, df = 10, Cox Snell $R^2 = 0.203$). The change in R^2 between specification (2) and

[18] *Message, word count,* and *apology* are inter-related: whether or not there is a *message* (with content) is related to *word count*; whether or not there is *apology* is related to *word count* and to *message.*

specification (1) indicates that *signal value* and new *promises* explain an additional 2.5% of the variance. Specification (3) of Table 8 additionally considers *message* to predict trust re-extension ($X^2 = 27.43$, $p = .004$, df = 11, Cox Snell $R^2 = 0.288$). The change in R^2 between specification (3) and specification (2) indicates that *message* explains an additional 8.5% of the variance. Similar conclusions can be drawn for specification (4) and specification (5).

Result 4: Investors' emotions, trustees' messaging targeting investors, and promised returns in both games predict subsequent game 2 *trust re-extension*.

4.3.3. *Trustees: Signal Value and ROI in Game 2 Predicted by Emotions*

In this section we evaluate whether trustees' emotional reactions to game 1 are predictive of game 2 demonstrations of trustworthiness (*signal value* and *ROI* in game 2).

For previously trusted trustees who were re-extended trust again in game 2, we estimated linear regression models, reported in Table 9a and Table 9b, where the dependent variable is the *signal value* of game 2 promise (the difference between game 2 return and promise) and the independent variables are the trustee emotional reactions to game 1 (pride, believability, guilt, shame), as well as the *signal value* in game 1 (to control for individual effects). Table 9a uses a sub-sample of game 1 promise keepers and Table 9b uses a sub-sample of game 1 promise breakers. There are two interesting results that emerge from comparing these two tables. First, the *signal value* in game 1 and the *signal value* in game 2 are positively correlated for promise breakers (Table 9a) and negatively correlated for promise keepers (Table 9b). Second, it appears that emotions play a more important role in regulating the subsequent behavior of promise keepers than promise breakers. Table 9b shows that trustees feelings of pride in game 1 is

positively correlated with *signal value* in game 2, trustees feelings of shame is negatively correlated with *signal value* in game 2.

Table 9a: Regression of Game 2 *Signal Value* on Promise Breaking Trustees' Emotions

Dependent variable	*Game 2 Return-Promise*	*Game 2 Return-Promise*	*Game 2 Return-Promise*	*Game 2 Return-Promise*
Specification	(1)	(2)	(3)	(4)
Game 1 Return-Promise	0.716***	0.727***	0.766***	0.757***
	(0.210)	(0.207)	(0.211)	(0.216)
Proud	-0.609			
	(0.745)			
Believable		-1.089		
		(0.857)		
Guilty			0.943	
			(0.807)	
Ashamed				0.734
				(0.974)
Constant	-1.19	-0.527	-4.580*	-3.647
	(2.301)	(2.242)	(2.371)	(2.192)
R-squared	0.274	0.294	0.289	0.272
Observations	36	36	36	36

Note: ** significant at 5%, *** significant at 1%. Standard errors in parenthesis.

Table 9b: Regression of Game 2 *Signal Value* on Promise Keeping Trustees' Emotions

Dependent variable	*Game 2 Return-Promise*	*Game 2 Return-Promise*	*Game 2 Return-Promise*	*Game 2 Return-Promise*
Specification	(1)	(2)	(3)	(4)
Game 1 Return-Promise	-0.863**	-0.887**	-0.774*	-0.562
	(0.415)	(0.417)	(0.441)	(0.460)
Proud	0.368*			
	(0.208)			
Believable		0.244		
		(0.233)		
Guilty			-0.590	
			(0.657)	
Ashamed				-1.507*
				(0.884)
Constant	-2.745***	-2.303***	-0.786	0.131
	(0.787)	(0.871)	(0.779)	(0.962)
R-squared	0.049	0.037	0.035	0.048
Observations	155	155	155	155

Note: ** significant at 5%, *** significant at 1%. Standard errors in parenthesis.

Next, we estimated linear regression models, reported in Table 10a and Table 10b, where the dependent variable is game 2 *ROI* (game 2 return divided by investment) and the independent variables are the trustee emotional reactions to game 1, as well as game 1 *ROI* (to control for individual effects). Table 10a uses a sub-sample of game 1 *promise keepers* and Table 10b uses a

sub-sample of game 1 *promise breakers*. The only significant emotion predicting *ROI* is shame experienced by *promise keepers* (Table 10b).

Result 5: Trustees' emotions predict their subsequent demonstrations of trustworthiness such as *signal value* and *ROI* in game 2.

Table 10a: Regression of Game 2 *ROI* on Promise Breaking Trustees' Emotions

Dependent variable	*Game 2 Return/Investment*	*Game 2 Return/Investment*	*Game 2 Return/Investment*	*Game 2 Return/Investment*
Specification	(1)	(2)	(3)	(4)
Game 1 Return-Promise	0.720***	0.699***	0.760***	0.759***
	(0.233)	(0.233)	(0.237)	(0.238)
Proud	-0.057			
	(0.126)			
Believable		-0.119		
		(0.148)		
Guilty			0.102	
			(0.138)	
Ashamed				0.107
				(0.165)
Constant	0.519	0.624	0.105	0.162
	(0.387)	(0.387)	(0.461)	(0.433)
R-squared	0.230	0.241	0.238	0.235
Observations	36	36	36	36

Note: ** significant at 5%, *** significant at 1%. Standard errors in parenthesis.

Table 10b: Regression of Game 2 *ROI* on Promise Keeping Trustees' Emotions

Dependent variable	*Game 2 Return/Investment*	*Game 2 Return/Investment*	*Game 2 Return/Investment*	*Game 2 Return/Investment*
Specification	(1)	(2)	(3)	(4)
Game 1 Return-Promise	0.611***	0.627***	0.618***	0.681***
	(0.225)	(0.226)	(0.225)	(0.223)
Proud	0.070			
	(0.045)			
Believable		0.024		
		(0.050)		
Guilty			-0.208	
			(0.133)	
Ashamed				-0.420**
				(0.169)
Constant	0.232	0.365	0.701	0.797*
	(0.433)	(0.444)	(0.445)	(0.432)
R-squared	0.064	0.050	0.064	0.086
Observations	155	155	155	155

Note: ** significant at 5%, *** significant at 1%. Standard errors in parenthesis.

5. Discussion

Emotional experiences reported by our participants explain as much as 30.1% of their subsequent behavior. That the studied emotions did not predict more of the observed variance in

messaging or trust re-extension may be a consequence of the unexplained variance in reported experiences of emotions. Our model based on game 1 antecedents explained between 20% and 47% of the variance in reports of each of the twelve emotional states studied, with more variance explained for the negative emotion states that were generally experienced with lower intensity. Below we consider whether some of the variance in emotional reports might be explained by differing interpretations of the emotion labels, design limitations of the survey instrument, or deliberately compromised reporting fidelity.

People who are asked to rate single emotions may not be able to accurately describe their emotional states (Ellsworth & Tong 2006) if emotion experiences are more often and accurately described with multiple words (Izard 1977), or with different words among different people. While we acknowledge that language could present problems for this research and have no controls, the success of previous research on self-reported emotions in conjunction with experimental games (Ketelaar & Au 2003; Hopfensitz & Reuben 2009) gave us encouragement in using our instrument to pursue measures of self-reported emotions following an economic game.

Data quality could also have been affected if our stimulus primed participants to experience specific emotions (e.g., as a consequence of experimenter demand) or if they were incentivized to make untruthful reports. Demand effects to provide inflated reports of the emotional states specifically studied in this report is unlikely because we surveyed a larger set of twenty emotional states and did not reveal the subset of emotional states that we were particularly interested in analyzing. Another concern is that if participants did not view the emotion survey as "incentive compatible", they may have been motivated to answer untruthfully. A meta-review by Camerer and Hogarth (1999) concludes that there is no clear evidence that

additional financial incentives would improve the quality of responses in a simple survey task like ours. In fact, for short tasks like these surveys that people are known to voluntarily complete without problem (because they have sufficient intrinsic motivation to do so), an attempt at increasing participation via financial incentives often "backfires" with counter-intentional effects (e.g., Mellstrom & Johannesson 2008). Nevertheless, wary of the possibility that participants may have been incentivized to use efficiency tactics to expediently complete the survey (such as by quickly marking all responses the same), we reviewed our data and found no cases of such behavior.

6. Conclusion

In this study we examined how participants who were given no indication of opportunity for subsequent interactions, experienced emotions after participating in a trust game, and how such emotions influenced subsequent behaviors when another opportunity for trust-based exchange unexpectedly arose. We found that emotions triggered by trust-based interaction outcomes are predictable and also predict subsequent messaging, apology, trust re-extension, and demonstrated trustworthiness. These findings advance our understanding of human behavior and they contribute to several areas of research.

First, our study provides support for the recalibrational theory of emotions. According to this theory, new information about outcomes triggers emotions, and, when experienced, these emotions recalibrate the system regulating one's propensity for subsequent behavior. In support of this theory, we find that positive emotions experienced after successful trust-based interaction motivate the investor to trust the trustee's cheap signals and re-extend trust, and motivate the *beneficent, promise keeper* trustees to issue shorter re-affirmative messages (word count M=6.33,

SD = 10.970)[19] and demonstrate more trustworthiness. Alternatively, a trustee's negative emotional reaction to acting untrustworthy (breaking a promise and exploiting the investor), motivates remedial efforts like longer messages (word count M= 19.06, SD = 19.031) and apology targeting the affected investor.

Second, our study provides an explanation for why "cheap-talk" (i.e., communication not necessarily affecting incentives, Farrell & Rabin 1996) is produced despite normative prediction, and why these kinds of messages are often effective. Though cheap-to-produce signals are not guaranteed to be reliable on their own and thus unexpected to persuade receivers (Zahavi 1993; Grafen 1990), they are frequently used by humans in the form of spoken or written words to negotiate trust between individuals with conflicting interests (Lachmann, Számadó & Bergstrom 2001). Our study suggests that cheap-to-produce messages are reliable because they are influence by predictable emotions in reliable ways. For example, we find that the predicted positive emotional responses by trustees decrease the likelihood of apology and the length of message. On the other hand, predicted negative emotional responses increase the likelihood of apology and the length of message. Not only do emotions predict the use of cheap-to-produce re-affirmative and remedial messages, but they also predict the subsequent behavior of trustees. In principal, investors who anticipate or have access to the dynamics of these emotional responses

[19] Space precludes a full content analysis, but cursory inspection reveals that these messages tend to be re-affirmative – calling attention to the successful exchange and intention to repeat it. Examples include "teamwork!", "same deal.", "same as last time :)", "we're a good pair. I don't know what else to say haha.", "same thing?", "lets do this!", "Pleasure doing business with you", "I will keep it equal like last time", "Let's just do the same transfer again", "Let's do the same… It worked and we both made some money!!!", "Same deal as before sounds about right, in my opinion", "Let's do the same thing, that way we both get the max amount of money", "Same thing again. We both benefit.", "I like the way we did it last time, it works out nicely for both of us and it's fair :) Thanks for being great!", "Heyo- happy to work with you again ¶ and do the same thing.", "well we worked together so far-want to do it again? at least we'll both make more than $5". Interested readers are encouraged to further examine the message content in Appendix D.

and communicative intentions should be able to reliably predict the behavior of trustees based on their messages.

Finally, our study shows that remedial behaviors (spontaneous messaging with apology) can facilitate the rebuilding of damaged trust, with emotions guiding behavioral propensities. This is an important finding, given that breaches of trust are a common problem in social and economic relationships, and corporate life (Robinson & Rousseau 1994; Barnett 2003).

For the past couple millennia scholars have recognized that emotions indeed matter in our everyday lives, but have argued over issues of whether and how emotions guide behavior. Much progress has been made towards understanding how emotions are triggered, and what their effects are on behavior, yet perhaps because of previous confusion or disagreement, the experimental study of emotions in behavioral economics and interpersonal relationships is still a frontier open for exploration. This study provides evidence that trust-based interaction outcomes trigger emotions in predictable ways that, in turn, influence our propensity towards subsequent behaviors. By triangulating with more objective neurological, physiological, and behavioral measures of emotional states some of the limitations of itemized self-reports could potentially be overcome. We see this as a fruitful avenue for future research

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Figure 1: Path Model of Predicted Relationship between Variables

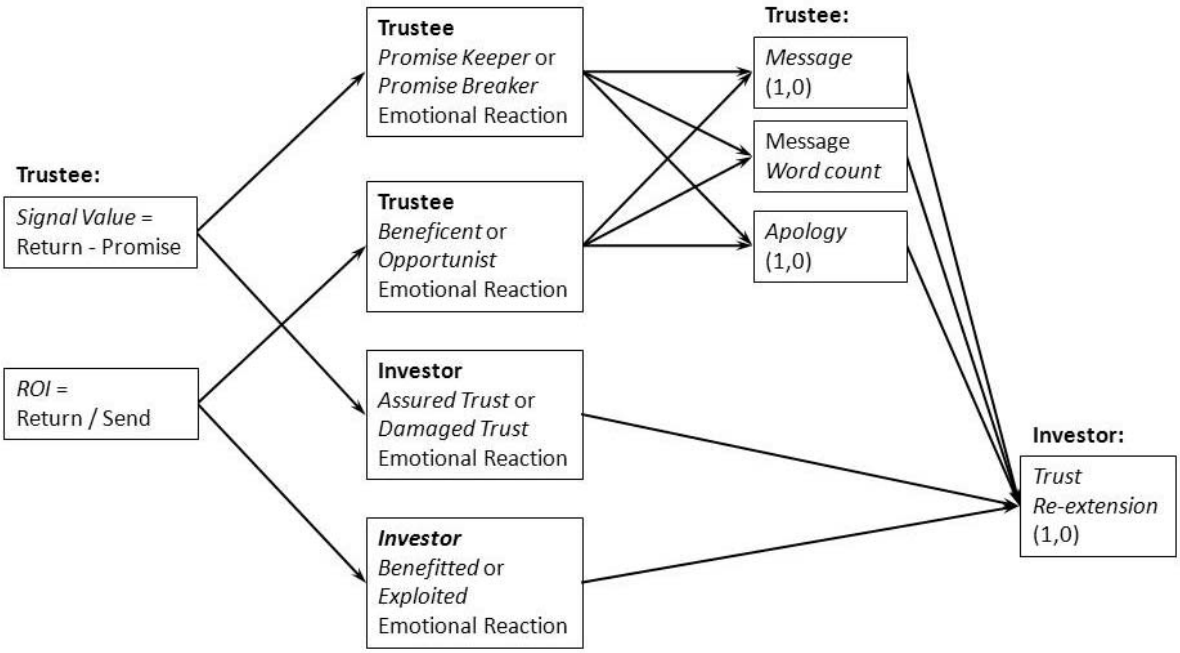


Figure 2: Bubble Plots of Trustees' Emotions and *Signal Value*

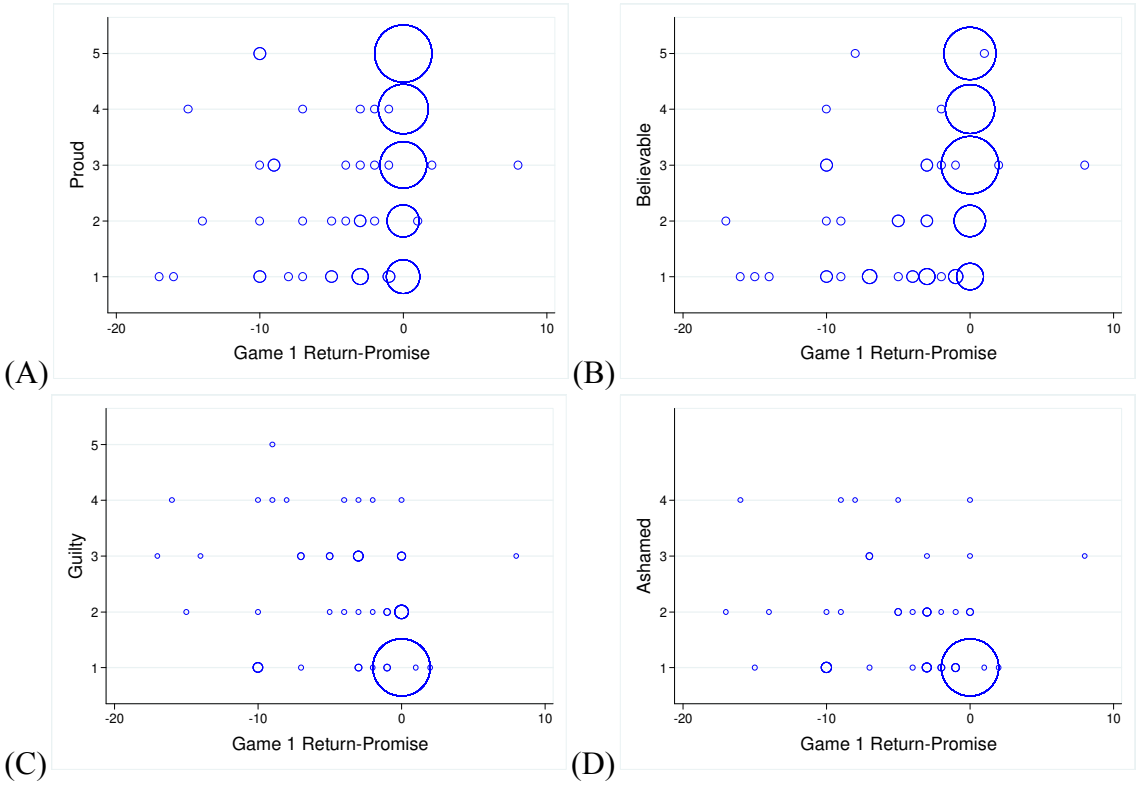


Figure 3: Bubble Plots of Trustees' Emotions and *ROI*

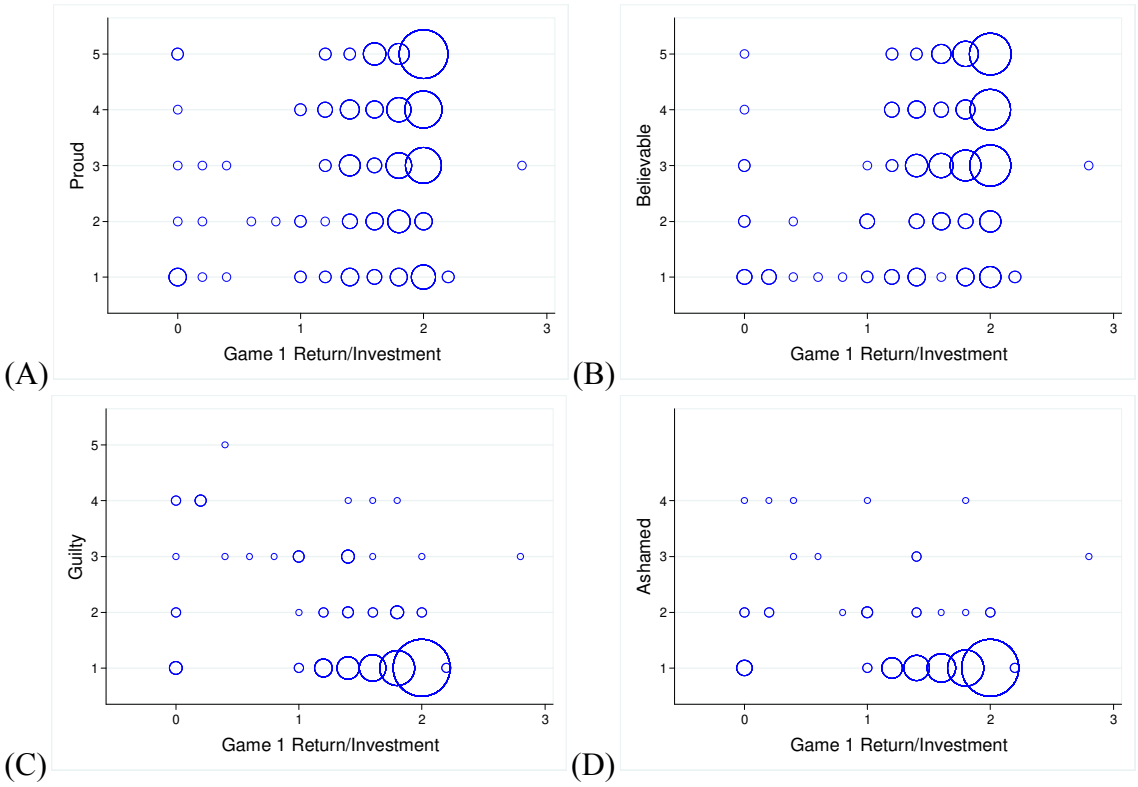


Figure 4: Bubble Plots of Investors' Emotions and *Signal Value*

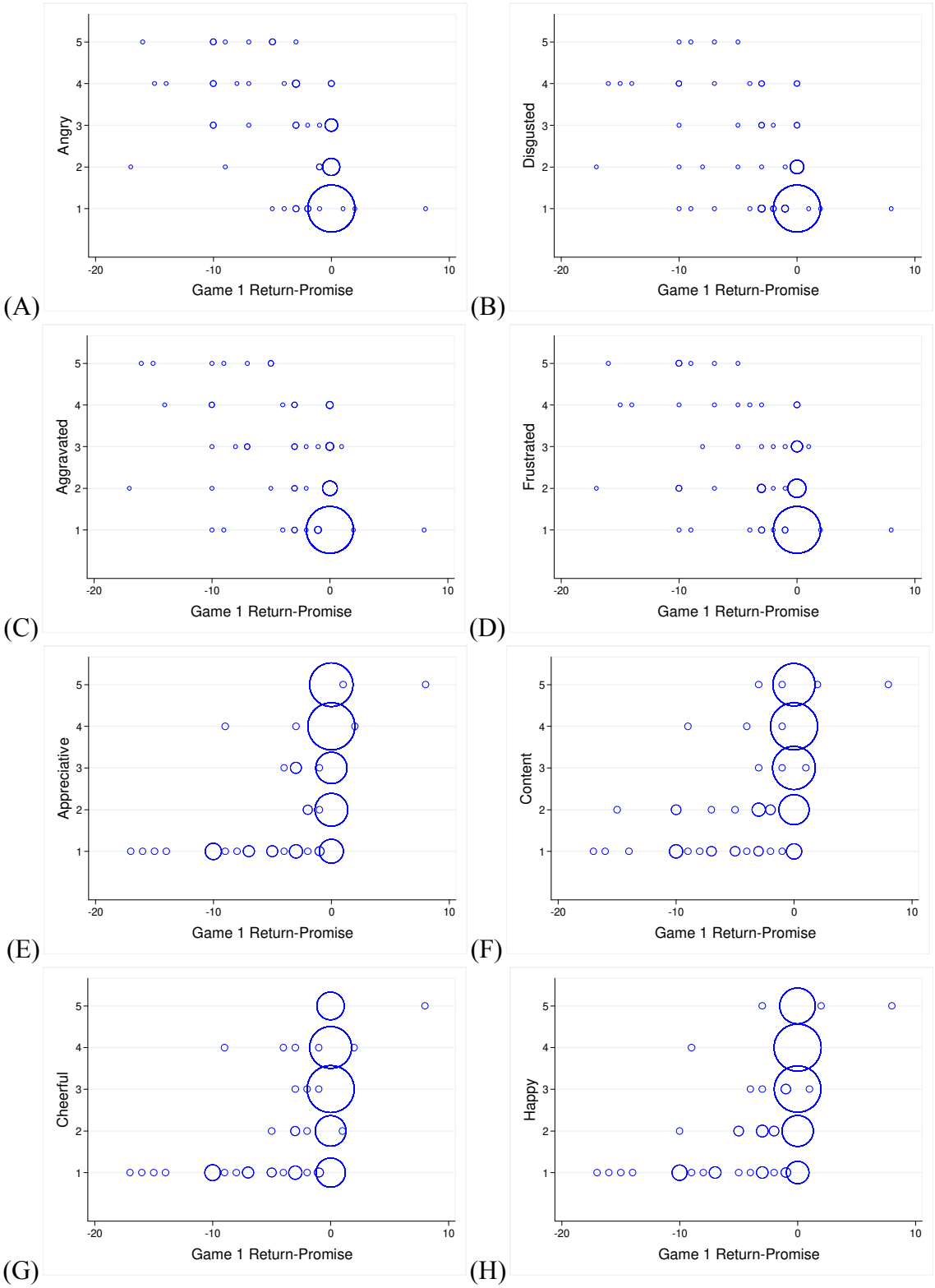
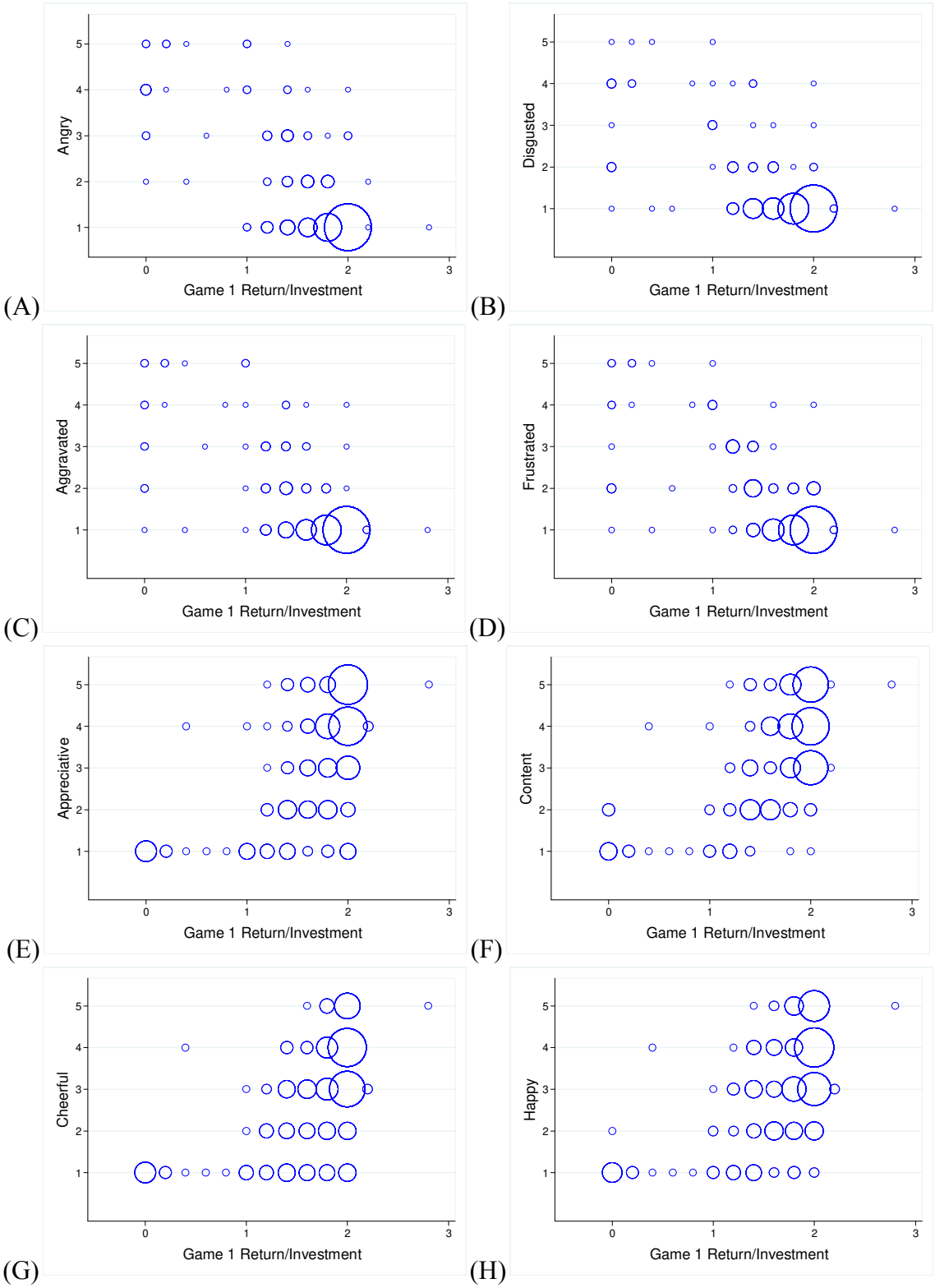


Figure 5: Bubble Plots of Investors' Emotions and *ROI*



Appendix A: Instructions

INSTRUCTIONS

Thank you for participating in this experiment. The purpose of this experiment is to study how people make decisions in a particular situation. Feel free to ask us questions as they arise, by raising your hand. Please do not speak to other participants during the experiment. You will receive $7 for participating in this session. You may also receive additional money, depending on the decisions made (as described below). Upon completion of the session, this additional amount will be paid to you individually and privately.

During the session, you will be paired with another person. However, no participant will ever know the identity of the person with whom he or she is paired.

DECISION TASKS

In each pair, one person will have the role of A, and the other will have the role of B. The amount of money you earn depends on the decisions made in your pair.

First, by choosing a dollar amount from $0 to $20, B indicates the proportion of a possible $20 income that he or she promises to transfer back to A, should A choose IN. Specifically, B will complete the following statement: "I (Participant B) promise to transfer back ___ of my income to you (Participant A) if you choose IN". The computer will convey B's statement to A, and then A and B will proceed as described below. B may still choose an amount to transfer back to A that is different than the amount promised.

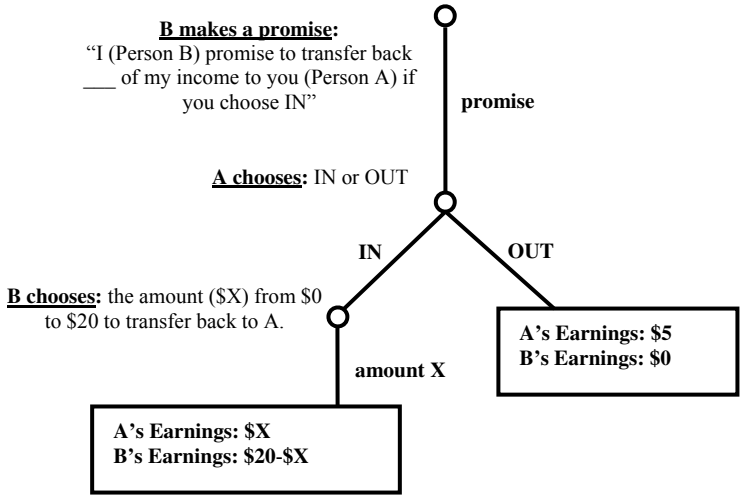
Having received a statement from B, A indicates whether he or she chooses IN or OUT. If A chooses OUT, A receives $5 and B receives $0. If A chooses IN, then B receives $20 income. In such a case, after receiving $20 income, B must choose a dollar amount from $0 to $20 to transfer back to A.

SURVEY

After having completed the decision tasks described above you will be asked to fill out a short 20 item survey.

DIAGRAM

The following diagram represents how the experiment proceeds:



(This part of the instructions was handed out after the first "experiment" was conducted.)

REPETITION OF THE EXPERIMENT

The same decision tasks that were just completed will be repeated again, with everyone remaining in the same A or B roles and paired with the same participants as in the previous tasks.

MESSAGE

Prior to repetition of the previous decision tasks, B has an option to send a message to A. B may use a text box to type a message, if desired. We will allow time as needed to construct and type messages. When B's message has been completed (by typing in the text box and clicking on the send button) it will be conveyed by the computer to the appropriate Participant A, and then A and B will proceed with decision tasks. In these messages, no one is allowed to identify him or herself by name, number, gender, or appearance. Other than these restrictions, B may say anything in the message. If you wish not to send a message, simply click on the send button without having typed anything in the message box.

DECISION TASKS AND SURVEY (REPEATED AS BEFORE)

This second set of decision tasks and the accompanying 20 item survey is the final part of the experiment. There will be no further tasks.

Appendix B: 20-item Emotion Survey

The following scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent the experiment in which you just participated made you feel.

Use the following scale to record your answers:
(1) very slightly or not at all, (2) a little, (3) moderately, (4) quite a bit, (5) extremely

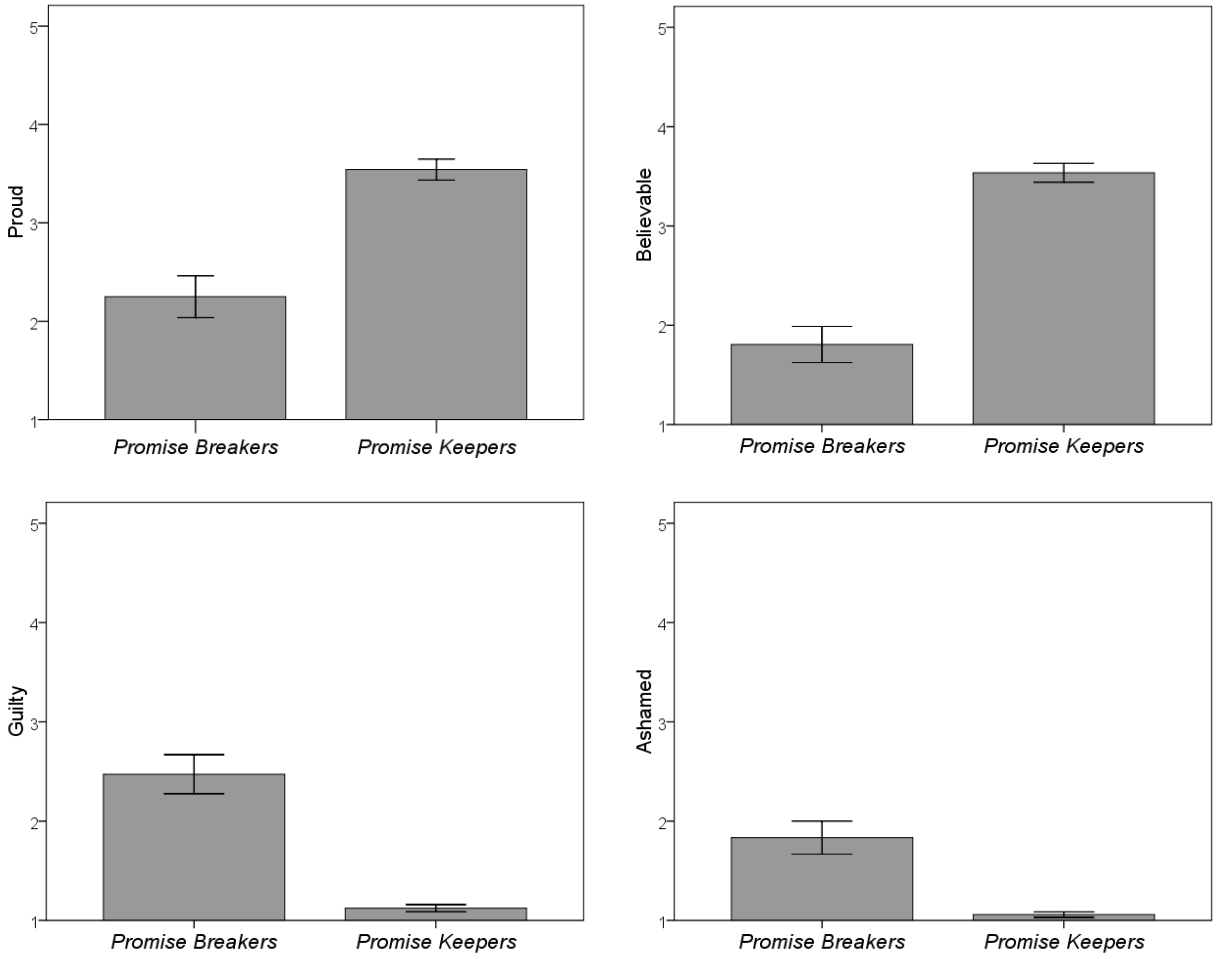
Guilty	1 ○ ○ ○ ○ ○ 5	Secure	1 ○ ○ ○ ○ ○ 5
Embarrassed	1 ○ ○ ○ ○ ○ 5	Angry	1 ○ ○ ○ ○ ○ 5
Proud	1 ○ ○ ○ ○ ○ 5	Disgusted	1 ○ ○ ○ ○ ○ 5
Ashamed	1 ○ ○ ○ ○ ○ 5	Jealous	1 ○ ○ ○ ○ ○ 5
Inspired	1 ○ ○ ○ ○ ○ 5	Surprised	1 ○ ○ ○ ○ ○ 5
Depressed	1 ○ ○ ○ ○ ○ 5	Appreciative	1 ○ ○ ○ ○ ○ 5
Believable	1 ○ ○ ○ ○ ○ 5	Cheerful	1 ○ ○ ○ ○ ○ 5
Content	1 ○ ○ ○ ○ ○ 5	Aggravated	1 ○ ○ ○ ○ ○ 5
Happy	1 ○ ○ ○ ○ ○ 5	Frustrated	1 ○ ○ ○ ○ ○ 5
Triumphant	1 ○ ○ ○ ○ ○ 5	Sad	1 ○ ○ ○ ○ ○ 5

OK

Appendix C: Comparisons of Emotions between Trustees and between Investors

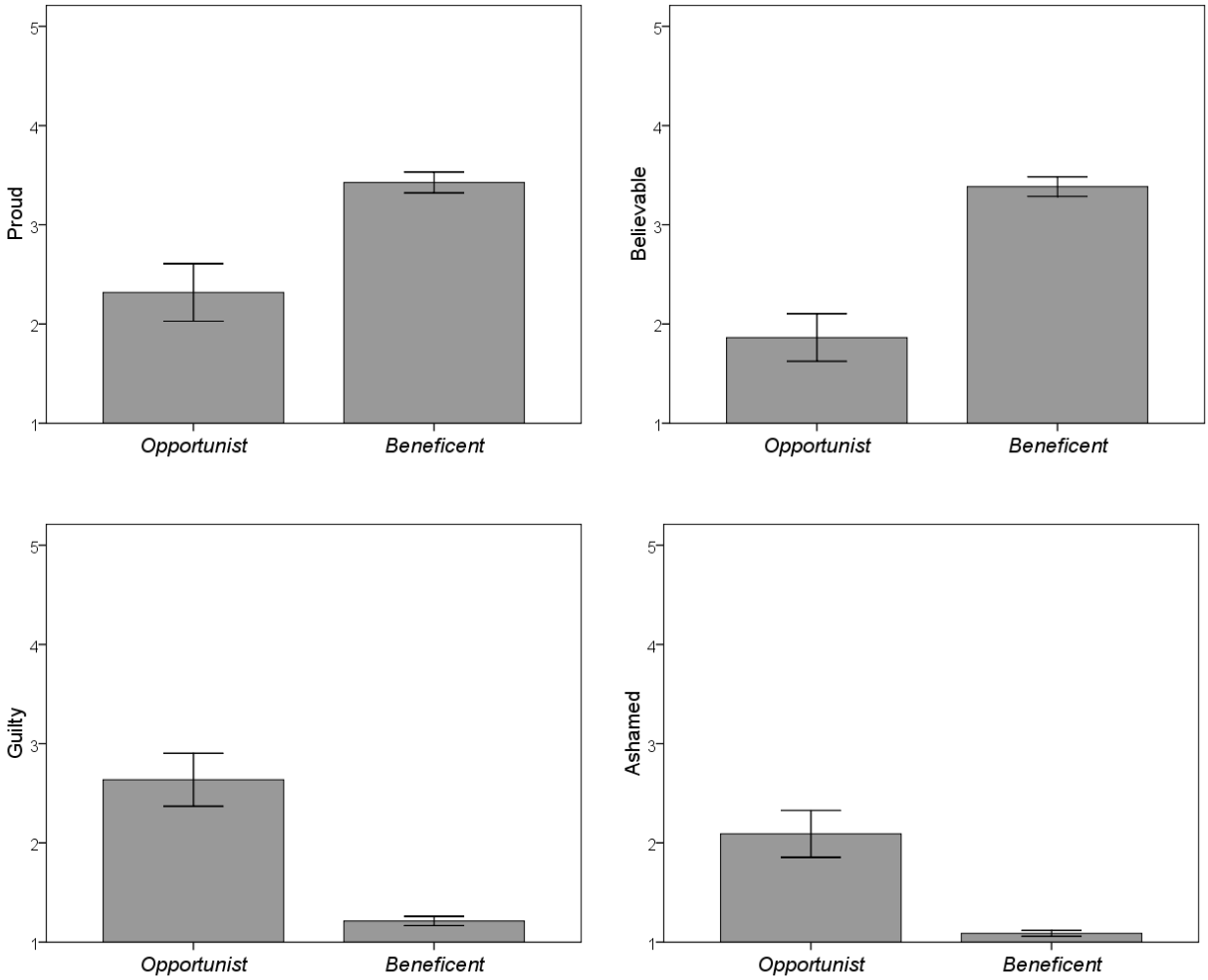
Here we provide bar charts of trustees' and investors' emotions and report the details of Welch's t-test comparisons between different groups of trustees (i.e., *promise breaker* vs. *promise keeper, opportunist* vs. *beneficent*) and investors (i.e. *damaged* vs. *assured*, *exploited* vs. *benefited*). These groups are hypothesized to have encountered distinct cooperation problems resulting from certain game interaction outcomes and we classify them accordingly. Trustees are classified into the following groups: *promise breakers* when game 1 return – game 1 promise < 0, *promise keepers* when game 1 return – game 1 promise ≥ 0, *opportunists* when game 1 return / game 1 investment ≤ 1, and *beneficent* when game 1 return / game 1 investment > 1. Investors are classified into the following groups: those with *damaged trust* when game 1 return – game 1 promise < 0, those with *assured trust* when game 1 return – game 1 promise ≥ 0, those who were *exploited* when game 1 return / game 1 investment ≤ 1, and those who *benefited* when game 1 return / game 1 investment > 1.

Figure C1: Bar graphs *Promise Breaker* and *Promise Keeper* Trustee Emotions



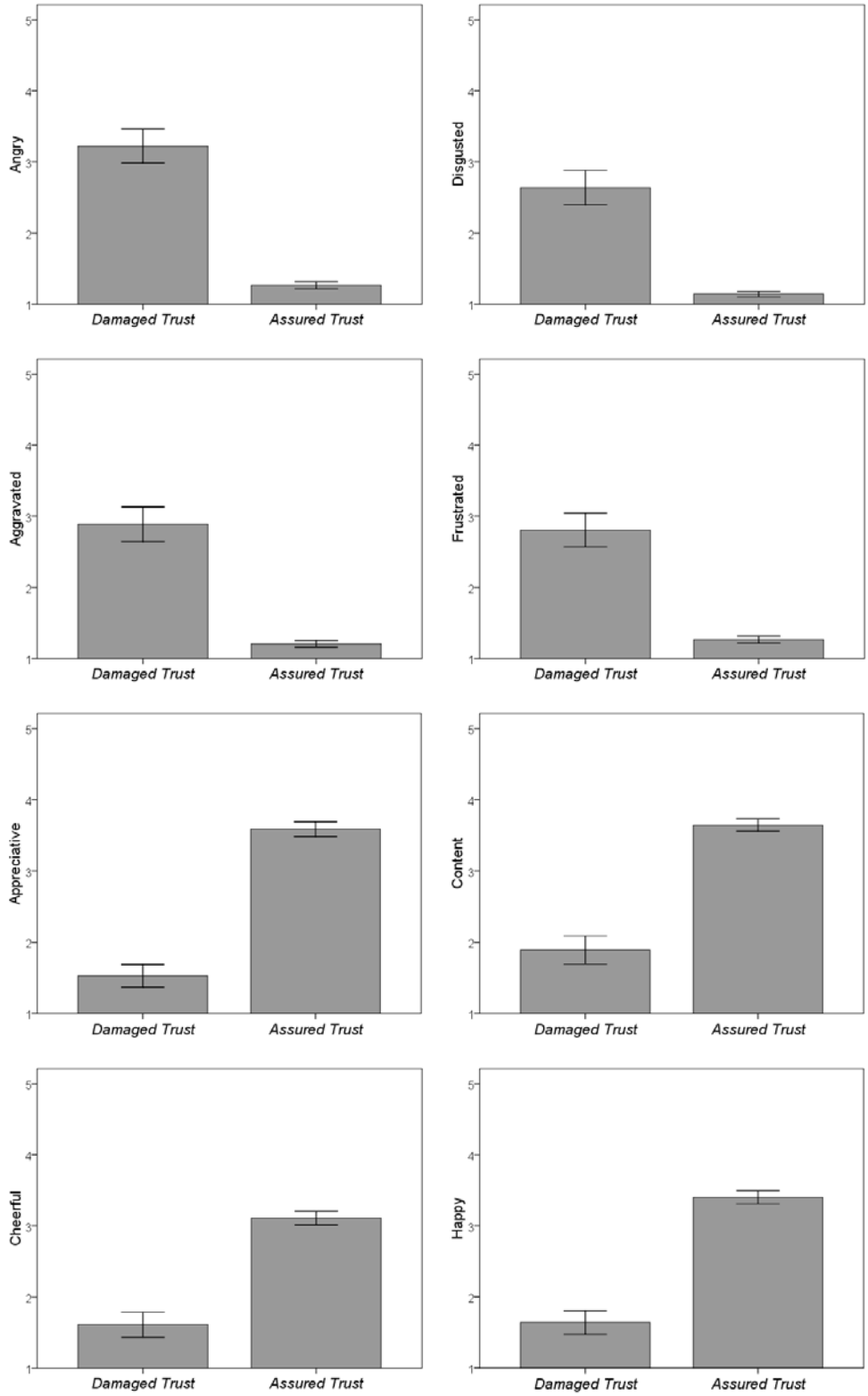
There was a significant difference ($t(189) = -5.291$, $p < .001$) in reports of pride between *promise keepers* M = 3.54 (SD = 1.330) and *promise breakers* M = 2.25 (SD = 1.273), a significant difference ($t(189) = -7.969$, $p < .001$) in reports of feeling believable between *promise keepers* M = 3.54 (SD = 1.191) and *promise breakers* M =1.81 (SD = 1.091), a significant difference ($t(189) = -11.238$, $p < .001$) in reports of guilt between *promise keepers* M = 1.12 (SD = 0.446) and *promise breakers* M = 2.47 (SD = 1.183), and a significant difference ($t(189) = -7.878$, $p < .001$) in reports of shame between *promise keepers* M = 1.06 (SD = 0.346), and *promise breakers* M = 1.83 (SD = 1.000).

Figure C2: Bar graphs *Opportunist* and *Beneficent* Trustee Emotions



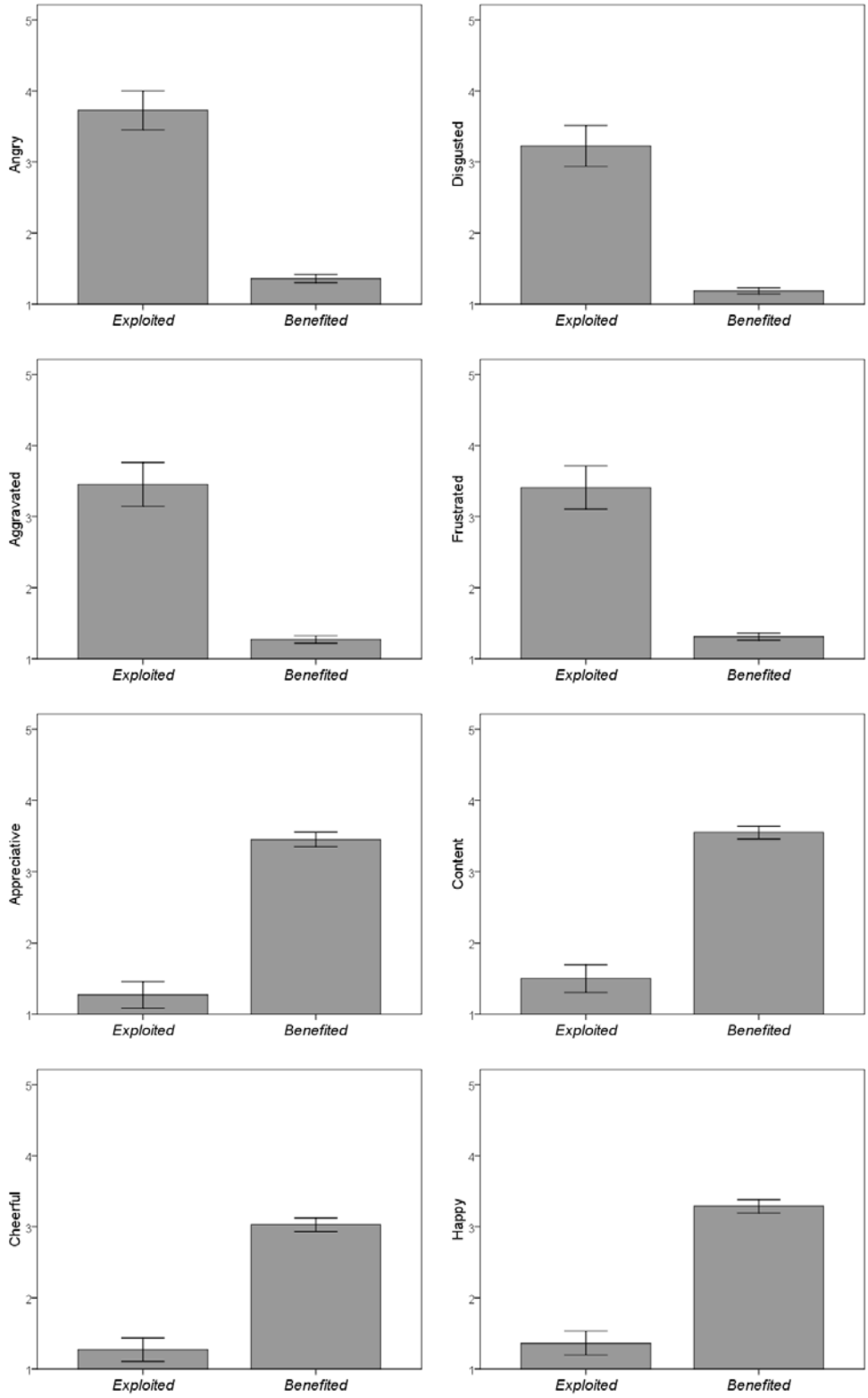
There was a significant difference ($t(189) = -6.965$, $p < .001$) between reports of pride by *beneficent* M = 3.43 (SD = 1.370) and *opportunist* trustees M = 2.00 (SD = 1.340), a significant difference ($t(189) = -6.203$, $p < .001$) between reports of feeling believable by *beneficent* M = 3.38 (SD = 1.282) and *opportunist* trustees M = 2.18 (SD = 1.308), a significant difference ($t(189) = 4.316$, $p < .001$) between reports of guilt by *beneficent* M = 1.21 (SD = 0.599) and *opportunist* trustees M =1.73 (SD = 1.205), and a significant difference ($t(189) = 5.833$, $p < .001$) between reports of shame by *beneficent* M = 1.09 (SD = 0.391) and *opportunist* trustees M =1.63 (SD = 1.025).

Figure C3: Bar graphs of Emotions for Investors who had Trust *Damaged* and *Assured*



Among negative emotion experiences there were significant differences ($t(189) = -12.644$, $p < .001$) in reports of anger between investors with *assured trust* M = 1.26 (SD = 0.625) and *damaged trust* M = 3.22 (SD = 1.436), significant differences ($t(189) = -10.645$, $p < .001$) in reports of disgust between investors with *assured trust* M = 1.14 (SD = 0.476) and *damaged trust* M = 2.64 (SD = 1.457), significant differences ($t(189) = -11.009$, $p < .001$) in reports of aggravation between investors with *assured trust* M = 1.21 (SD = 0.589) and *damaged trust* M = 2.89 (SD = 1.469), and significant differences ($t(189) = -10.051$) in reports of frustration from investors with *assured trust* M = 1.26 (SD = 0.615) and *damaged trust* M = 2.81 (SD = 1.431). Among positive emotion experiences there were significant differences ($t(189) = 9.071$, $p < .001$) in reports of appreciation between investors with *assured trust* M = 3.59 (SD = 1.283) and *damaged trust* M = 1.53 (SD = 0.941), significant differences ($t(189) = 8.476$, $p < .001$) in reports of contentment between investors with *assured trust* M =3.65 (SD = 1.103) and *damaged trust* M =1.89 (SD = 1.190), significant differences ($t(189) = 6.937$, $p < .001$) in reports of cheerfulness between investors with *assured trust* M =3.11 (SD = 1.193) and *damaged trust* M = 1.61 (SD = 1.050), and significant differences ($t(189) = 8.491$; $p < .001$) in reports of happiness between investors with *assured trust* M =3.40 (SD = 1.149) and *damaged trust* M =1.64 (SD = 0.990).

Figure C4: Bar graphs of Emotions for *Exploited* and *Benefited* Investors



Among negative emotion experiences there were significant differences ($t(189) = 12.337$, $p < .001$) in reports of anger between investors who had *benefited* M = 1.36 (SD = 0.775) and been *exploited* M = 3.73 (SD = 1.279), significant differences ($t(189) = 12.763$, $p < .001$) in reports of disgust between investors who had *benefited* M = 1.193 (SD = 0.577) and been *exploited* M = 3.23 (SD = 1.343)), significant differences ($t(189) = 12.138$, $p < .001$) in reports of aggravation between investors who had *benefited* M = 1.27 (SD = 0.67) and been *exploited* M = 3.45 (SD = 1.438), and significant differences ($t(189) = 11.920$, $p < .001$) in reports of frustration between investors who had *benefited* M = 1.31 (SD = 0.647) and been *exploited* M = 3.41 (SD = 1.436). Among positive emotion experiences there were significant differences ($t(189) = -7.426$, $p < .001$) in reports of appreciation between investors who had *benefited* M =3.45 (SD = 1.336) and been *exploited* M = 1.27 (SD = 0.883), significant differences ($t(189) = -7.940$, $p < .001$) in reports of contentment between investors who had *benefited* M = 3.55 (SD = 1.165) and been *exploited* M = 1.50 (SD = 0.913), significant differences ($t(189) = -6.568$, $p < .001$) in reports of cheerfulness between investors who had *benefited* M = 3.03 (SD = 1.222) and been *exploited* M = 1.27 (SD = 0.767), and significant differences ($t(189) = -7.304$, $p < .001$) in reports of happiness between investors who had *benefited* M = 3.29 (SD = 1.202) and been *exploited* M = 1.36 (SD = 0.790).

Appendix D: Promises and Messages

Table D1: Promise-Breakers Messages

Promised Game 1	Returned Game 1	Message	Word-count	Broad Apology	Promised Game 2	Trusted? Game 2	Returned Game 2
15	**0**	Let's split even. $10 and $10.	**6**	**YES**	**10**	**YES**	**8**
10	**1**	If I knew there were 2 rounds I would have split it up even the first round. This round I'll make it up to you by giving you 15 if you're IN, this way we both end up with more money. Sorry again.	**43**	**YES**	**15**	**YES**	**3**
10	**0**	Hey im sorry about that I didn't realize there was going to be another round.! Let me make things right.	**20**	**YES**	**15**	**YES**	**5**
10	**9**	i'll do the same deal as last time, sound fair?	**10**	**NO**	**15**	**YES**	**9**
10	**7**	to even out i will give you 13 and i will take 7	**13**	**YES**	**13**	**YES**	**10**
10	**0**	doooooooood we all here to make muney baby so why dont we just split this huney down da middle, a lil lovin for da both of us? ill forrealze give you like 10 bucks and ill keep 10 you dig? stay fresh ;)	**43**	**YES**	**10**	**YES**	**0**
10	**7**	How much would you want this time seeing how you didn't have a choice last time? I'm willing to make it even between the two of us.	**27**	**YES**	**13**	**YES**	**0**
10	**5**	Hello A! I'm sorry I fell back on my promise, haha. To be honest, I'm dead broke and I haven't eaten all day and I'm literally about to run out of gas in my car, and those extra five dollars are going to help me out with that! ¶ If you choose out the most you are going to get is 5 more dollars, I can promise you that I'll agree to give you $10 if you choose in. Hopefully this works out! Either way, have a good one!	**88**	**YES**	**12**	**YES**	**12**
8	**5**	I only sent less than promised because I wanted to see what would happen	**14**	**YES**	**10**	**YES**	**10**
10	**2**	Hi, I was a little confused as to the experiment before. But I will stay true to this promise	**19**	**YES**	**9**	**YES**	**9**
13	**9**	lets split the money 10 and 10	**7**	**YES**	**10**	**YES**	**10**
10	**8**	I apologize for cheating you out of your $2 - normally I'm not the kind of person to do that sort of thing. When two people aren't face-to-face they usually have more confidence to do things they wouldn't normally do. This time I promise I'll play fair.	**47**	**YES**	**9**	**YES**	**9**
10	**7**	I didn't know we were repeating this. This time I really will split 50/50 :)	**15**	**YES**	**10**	**YES**	**10**
11	**2**	I will transfer back 18 to you this time to make it fair ¶ so we will have the same amount. I promise this time.	**24**	**YES**	**18**	**YES**	**10**
14	**11**	Hi. I apologize for short changing you. I should have been honsest and gone off the first example. I went off the third example w/my self interest in mind. I'll keep my word this time.	**35**	**YES**	**18**	**YES**	**18**
11	**10**	10/10?	**1**	**YES**	**12**	**YES**	**7**
8	**0**	sorry about last time i feel bad.....50/50 this time?	**10**	**YES**	**10**	**YES**	**0**
8	**7**	Strategy :)	**1**	**YES**	**10**	**YES**	**10**
10	**0**	I feel bad that you now only have the option of going home with $5 so you should click in again and i will give you $12 so that you go home with more than just the basic amount possible	**40**	**YES**	**12**	**YES**	**0**
8	**6**	My sincerest appologies on that last one...I do feel quite guilty ¶ and I assure you that this time I shall keep my promise with utmost integrity. You have	**34**	**YES**	**16**	**YES**	**1**

		my word as an honest gentleman.					
10	**7**	I feel bad for promising 10 and giving you 7. If you choose in I'll send you 13 so that we'll come out even.	**24**	**YES**	**13**	**YES**	**13**
5	**1**	my bad...	**2**	**YES**	**10**	**YES**	**8**
10	**3**	I'll transfer back more money this time ¶ actually $10	**9**	**YES**	**11**	**YES**	**10**
10	**8**	Hi ¶ I was testing if it really will let me decide how much I can get myself. This time I will give you the right amount I promised.	**28**	**YES**	**10**	**YES**	**10**
10	**0**		**0**	**NO**	**20**	**YES**	**0**
10	**0**	This time I'll give you what I promise. Sorry!	**9**	**YES**	**10**	**NO**	
10	**0**	ok for real this time haha. The first time was a joke lol	**13**	**YES**	**15**	**NO**	
17	**0**	May God bless you	**4**	**NO**	**13**	**NO**	
10	**7**	In the previous exercise I wanted to see if one really could promise one amount and then give another. After seeing that it is possible, I promise to give you the amount I state.	**34**	**YES**	**10**	**NO**	
17	**1**	i know that there is no reason you'd trust me because i didn't follow through with my promise last time ¶ but if you choose in i will transfer all of the money that i say i will. ¶ for real this time.	**41**	**YES**	**18**	**NO**	
10	**5**	Even though I was decietful ¶ you were no worse off then had you picked OUT. The other option would have still led you to $5.	**25**	**YES**	**5**	**NO**	
12	**5**		**0**	**NO**	**20**	**NO**	
18	**4**		**0**	**NO**	**12**	**NO**	
7	**6**		**0**	**NO**	**9**	**NO**	
10	**5**		**0**	**NO**	**8**	**NO**	
10	**7**		**0**	**NO**	**10**	**NO**	

Table D2: Distrusted Trustees Messages

Promised Game 1	Message	Word-count	Promised Game 2	Trusted? Game 2	Returned Game 2
11	8 seems fair	**3**	**8**	**YES**	**0**
16	lets go 50/50. i give you $10, i get $10. ¶ its almost christmas....	**13**	**10**	**YES**	**1**
9	I want to split the money right down the middle. I will give you ten dollars and I will get ten dollars. If you choose out you will get less and both of us will come out empty handed. This is for the benefit of both parties and you will make more money in this way than you will by opting out.	**62**	**10**	**YES**	**1**
5	hey if i transfer 9 to you will you accept ?	**11**	**9**	**YES**	**8**
10	Trust me this time. Please?	**5**	**10**	**YES**	**7**
10	hi! i was actually going to give you the $10 that time! You would have made more money! I promise to give what I promise to you this time as well!	**31**	**8**	**YES**	**5**
11	Hello, ¶ I think $11.00 for you is a fair price for this survey and it is more than the $5.00 you get for choosing Out. I will keep my offer the same if you chose In. ¶ Thank you	**37**	**11**	**YES**	**12**
10	Hey! Okay, listen, I was genuinely going to give you ten dollars. I think it makes sense for both of us to make as much money as possible. I'm not trying to trick you. I'm just poor and want a few extra dollars to buy Christmas presents. So could you please just be in" next time? That way we can both make more. I promise I am not lying to you. I know it's anonymous but please trust me. :("	**80**	**9**	**YES**	**10**
6	You click out, you earn 5. You accept my offer, you earn 6. It doesn't make any sense to click OUT. This is not a situation where my gain affects your profits in the future, this isn't one business earning a little bit and another earning a lot at its expense. You have to option of $6 or $5, without repercussions or any damage in the future. Me getting 0 does you no good, all it does is hurt you. If you want $5, click OUT. But it obviously makes more sense to click IN.	**95**	**6**	**YES**	**7**
1	If I offer you at least 30% of my income we both make more than if you opt out.	**19**	**7**	**YES**	**7**
8	How about 10? We will both make the same amount evenly.	**11**	**10**	**YES**	**10**
10	I am a person of my word. I will transfer back $10 so we both make the same amount of money and more money than if you pick OUT	**29**	**10**	**YES**	**10**
10	I will offer 10 dollars of my income to you. If you choose in, then you will recieve 10 dollars and i will recieve 10 dollars. If you choose out, you will only recieve 5 dollars.	**36**	**10**	**YES**	**10**
20	I will split it with you so we both get ten dollars.	**12**	**10**	**YES**	**10**
6		**0**	**9**	**YES**	**9**
6	Please trust me when I say I will give you the amount I will promise you. This way, we will both earn more money instead of you just earnint $5 and me earning nothing. Let's take all of their money together!	**41**	**7**	**YES**	**7**
5	I will transfer 10 dollars.	**5**	**10**	**YES**	**10**
5	Hey ¶ to make this a win-win situation for both of us ¶ I'll transfer $10 and that way both of us will earn the same amount. It's really a good gameplan. :)	**31**	**0**	**YES**	**8**
7	Ok ¶ so this time let's make it actually fair.... I should have made it even last time. So this time if I give you back $8 ¶ you'll leave with $20 and I'll leave with $19. you still come out on top ¶ but I don't mind. And that's more than you'll make if you click OUT. I'm in the same boat as you....I too am poor as hell and would like to make some easy cash....	**75**	**8**	**YES**	**8**
20	I will transfer you back 75% back.	**7**	**10**	**YES**	**0**
5	We can figure out a way to divide the amount of the $20 equally if the result from that will have us leave here with more than $7	**28**	**10**	**YES**	**9**
10	I won't ask you to trust me. That's your choice ¶ what I will say though is offer you $10 to each of us. We both walk away from this evenly and both better off than we came in.	**38**	**10**	**YES**	**10**
4	I promise to transfer back 20 of my income to you. I really need this extra money. I hope you understand	**21**	**20**	**YES**	**0**
9	Let's be fair and split the pool evenly. Trust that I will not go back on what I say.	**19**	**10**	**YES**	**10**
6	I will give you half of the amount of the income	**11**	**12**	**YES**	**0**
5	Hello A ¶ I'm stoked to be making money while my roomate snores away. Hahaha. ¶ Cha-ching ly ¶ B.¶	**16**	**4**	**YES**	**4**

20	if i say $20 and you accpet ¶ I promise to give you $20 back so we both leave with $20 ¶ the max amount	**23**	**20**	**YES**	**20**
8	I promise to uphold any deals set before me	**9**	**10**	**YES**	**10**
6	I promise to give you $7 for clicking "in." I guarantee it. As I see it ¶ this gives you $2 more dollars than you would recieve by clicking "out." It's a win-win situation.	**33**	**7**	**YES**	**7**
8		**0**	**10**	**YES**	**0**
5	I think you should choose IN because it is simple game theory. If you choose IN and I choose to give you $10 ¶ which I promise to give you ¶ then we both win. I know that you would automatically want to choose OUT so that you can get $5 no matter what ¶ but I promise you that you will get $10. We both want to get money ¶ and this is a good way to share our earnings. I hope you choose IN! :)	**83**	**5**	**YES**	**0**
10	If I offered you 10$ why would you rather get 5?	**11**	**10**	**YES**	**10**
6	Ouch.): I'm not gonna scam you, dude. When I make a promise, I make a promise. We both make more money this way; it's good all around!	**28**	**6**	**NO**	
5	hey Participant a make a deal dont do like this we should come here to earn money kul	**18**	**1**	**NO**	
10	dont be an asshole	**4**	**7**	**NO**	
10	Trust me.	**2**	**10**	**NO**	
6	You'll get more than $5.	**5**	**8**	**NO**	
8	Hello there! So it's probably hard to trust me ¶ in that I will return your money? And I would quite frankly feel the same way. The thing is though that you don't know me but I know me and I know that when I make a promise I keep it. I hope you can trust in me. :)	**58**	**7**	**NO**	

Table D3: Promise-Keepers Messages

Promised	Returned	Message	Word-count	Promised Game 2	Trusted? Game 2	Returned Game 2
6	**14**	I paid out more than I promised to transfer back the first time as a reward for going IN	**19**	**10**	**YES**	**0**
6	**6**	merry christmas!	**2**	**10**	**YES**	**10**
10	**10**	Same deal as before sounds about right, in my opinion.	**10**	**10**	**YES**	**10**
8	**8**	i guess you need the money too so we should split it!	**12**	**10**	**YES**	**10**
10	**10**	Hey there. Want to do the same thing again, and both come out ahead?	**14**	**10**	**YES**	**10**
9	**9**	hey so 10 and 10 this time?	**7**	**10**	**YES**	**10**
10	**10**	I will split it equally	**5**	**10**	**YES**	**10**
10	**10**	Thanks for accepting my last offer. I promise to always uphold my side of the deal.	**16**	**10**	**YES**	**10**
9	**9**	hello A! :)	**3**	**7**	**YES**	**7**
7	**7**	I won't lie to you. I know we're all broke college students here who need to make money. ugh	**19**	**8**	**YES**	**8**
10	**10**	This is tres bizarre.	**4**	**10**	**YES**	**10**
5	**5**	i send you 10 and you hit in..that way we both get the same amount of money. =]	**19**	**10**	**YES**	**10**
10	**10**	Let's do the same thing, that way we both get the max amount of money	**15**	**10**	**YES**	**0**
10	**10**	we'll go 50/50 on everything. i promise.	**7**	**10**	**YES**	**10**
6	**6**	we're a good pair. i dont know what else to say haha.	**12**	**6**	**YES**	**1**
11	**11**	expecto patronum!	**2**	**11**	**YES**	**2**
10	**10**	Pleasure doing business with you :)	**6**	**10**	**YES**	**10**
9	**9**	:) I dont know what to say haha but ill split it 50 50 this time for you	**18**	**10**	**YES**	**10**
10	**10**	Let's make some MONEY :) click in on all of them and i'll try and make it as fair as possible.	**21**	**10**	**YES**	**10**
9	**9**	I hope you are satisfied with the amount of money I offered you. I will offer more this time.	**19**	**10**	**YES**	**10**
10	**10**	I don't really have anything to say...let's split the money 10-10 again	**13**	**10**	**YES**	**10**
10	**10**	$10 is better than $5. Trust me, I'm a doctor haha	**11**	**10**	**YES**	**10**
6	**6**		**0**	**6**	**YES**	**6**
7	**7**	I will do exactly the same thing as I did before.	**11**	**7**	**YES**	**7**
10	**10**	Lets split it 11/ 9 everytime, that way we both get more money IN than OUT? sound good? I don't think you can answer me. . .	**27**	**9**	**YES**	**9**
6	**6**	Again I will promise $6. Please choose IN as it will maximize the profit that both of us can potentially made. I promise that I will send the full amount and if we can trust each other i will increase the amount I send in the following round. Thank you.	**50**	**6**	**YES**	**6**
10	**10**	Same as last time? It's only fair we earn the same amount.	**12**	**10**	**YES**	**10**
10	**10**	hi. i think it's best when we split it! makes it fair for everyone	**14**	**10**	**YES**	**10**
10	**10**	ill give u ten everytime if you choose IN then we both get ten dollars everytime we both go home with the same amount of money. again ten dollars a piece everytime go home with same amt. :)	**38**	**10**	**YES**	**10**
10	**10**		**0**	**10**	**YES**	**10**
6	**6**	want to choose in and then we take half? 10 each?	**11**	**10**	**YES**	**10**
8	**8**		**0**	**8**	**YES**	**8**
10	**10**	Let's keep going 50/50	**4**	**10**	**YES**	**10**
7	**7**	I promise to transfer you more money than last time.	**10**	**9**	**YES**	**9**
9	**9**	Hi, hope you're content with the $9	**7**	**10**	**YES**	**10**
10	**10**	Let's split the 20 evenly, 10-10	**6**	**10**	**YES**	**10**
10	**10**	Want to just split it again?	**6**	**10**	**YES**	**10**
10	**10**	same thing as before, we both might as well walk out with enough for gas money!	**16**	**10**	**YES**	**10**
10	**10**	same thing?	**2**	**10**	**YES**	**10**
9	**9**		**0**	**9**	**YES**	**9**

10	**10**	I will keep it equal like last time.	**8**	**10**	**YES**	**10**
8	**10**		**0**	**7**	**YES**	**9**
9	**9**		**0**	**9**	**YES**	**9**
8	**8**	Same as before Ill send you 8. We both get more $$ that way!	**14**	**8**	**YES**	**0**
10	**10**	Same deal.	**2**	**10**	**YES**	**10**
10	**10**		**0**	**10**	**YES**	**10**
8	**8**		**0**	**8**	**YES**	**5**
10	**10**	i promise to do 50/50 again	**6**	**10**	**YES**	**10**
8	**8**		**0**	**8**	**YES**	**8**
8	**8**	hey, so i just want you to know that i'll probably sent you $8 or $9! nice working with you!	**20**	**8**	**YES**	**8**
10	**10**	I like the way we did it last time, it works out nicely for both of us and it's fair :) ¶ Thanks for being great!	**24**	**10**	**YES**	**10**
10	**10**	I will be fair.	**4**	**10**	**YES**	**10**
6	**6**	Hi A! :)	**3**	**9**	**YES**	**6**
8	**8**	I'm going to do the same thing.	**7**	**8**	**YES**	**9**
9	**9**	I hope you're having a great day!	**7**	**8**	**YES**	**8**
9	**9**	Teamwork!	**1**	**10**	**YES**	**10**
10	**10**	I promise not to screw you out of any money and to transfer back what I say I will. If you choose in¶ we'll both benefit more! =D¶	**28**	**8**	**YES**	**8**
10	**10**	Don't worry, we'll evenly split the money this time, too, just like last time. I won't try to scam you or anything, because that's below me. You'll get the 10 dollars that I promise you. :)	**36**	**10**	**YES**	**10**
10	**10**	I'm not a risk taker and I'm not a dick. I said I'd give back ten before, and I did. We both want money. You can make $5 or $10 because I will give you ten again. yayyy money=))	**39**	**10**	**YES**	**10**
10	**10**	If we do this again, i'm always going to keep it equal for both of us.	**16**	**10**	**YES**	**10**
10	**10**	Hi, so I know it's hard to trust someone who you don't even know but I'll be I'll do my best to make things work.	**25**	**9**	**YES**	**9**
10	**10**	I figure we are both equally desperate for cash.	**9**	**10**	**YES**	**10**
9	**9**	Hi Participant A ¶ I hope you trust me due to the previous round. I will take care of you and uphold to my promises, if you take care of me. Deal? Now lets do this and make some bank! ¶ ¶ Signed, ¶ Participant B	**41**	**10**	**YES**	**10**
8	**8**	I'm going to offer $8 again. Hopefully you choose IN. That way we can both make a profit.	**18**	**8**	**YES**	**8**
10	**10**	Have you ever done this before?	**6**	**10**	**YES**	**10**
10	**10**		**0**	**10**	**YES**	**10**
10	**10**	Same thing? Seems fair? ...	**4**	**10**	**YES**	**10**
9	**9**	i promise i will give you what i say i will	**11**	**10**	**YES**	**10**
10	**10**	Thanks, glad we're both making a good amount of money! It's tough starting us off though! Wish you the best!	**20**	**10**	**YES**	**5**
10	**10**	Hello. Hope this doesn't sound creepy or anything. I think we should work together to get out of here with the same amount of money. I'm going to send over 10 again. :)	**33**	**10**	**YES**	**10**
10	**10**	I think each of us getting 10 dollars is fair. do you agree?	**13**	**10**	**YES**	**10**
8	**8**	same as last time :)	**5**	**8**	**YES**	**8**
9	**9**		**0**	**9**	**YES**	**9**
10	**10**	You can trust me :)	**5**	**10**	**YES**	**10**
10	**10**	Keep it even again	**4**	**10**	**YES**	**10**
10	**10**	i chose to give $10 dollars and gave you $10 in that last part. i hope we get paid	**19**	**10**	**YES**	**10**
10	**10**	I'm going to do the same thing as last time, 10 for you and 10 for me. We both would then walk away with 27 dollars :)	**27**	**10**	**YES**	**10**
8	**8**		**0**	**8**	**YES**	**8**
9	**9**		**0**	**9**	**YES**	**9**
10	**10**	Hope you like the wind....	**5**	**10**	**YES**	**10**
8	**8**	Were you happy with the outcome?	**6**	**9**	**YES**	**9**
10	**10**	Hey if you accept the $10 then we both make that everytime and thats the most mutually beneficial.	**18**	**10**	**YES**	**10**

10	**10**	Same thing again. We both benefit.	**6**	**10**	**YES**	**10**
10	**10**	hi! let's split the money 50/50 and each get 10 every time	**12**	**10**	**YES**	**10**
7	**7**		**0**	**7**	**YES**	**7**
10	**10**	Thanks for choosing IN :) hopefully if we do the same thing again we'll both make $20 each? thanks!	**19**	**10**	**YES**	**10**
10	**10**	Hello ¶ I wanted to make things 50/50. I don't really understand but that seemed fair to me at least	**19**	**10**	**YES**	**10**
7	**7**	I have no idea what to say here. This is a nice text box?	**14**	**8**	**YES**	**1**
9	**9**	I believe example 1 seemed the fairest for the position i was given. I did not want to be unfair however it seemed necessary to try and make a profit. I chose the smallest profit option which gave us both money in the end.	**44**	**9**	**YES**	**9**
10	**10**	I'll give you $10 just like before if you say "IN." ¶ It's a win-win (I get $10 instead of $0 and you get $10 instead of $5 if you were to say "OUT."	**32**	**10**	**YES**	**10**
7	**7**	I need a nap...	**4**	**11**	**YES**	**10**
10	**10**	Let's just do that same transfer again	**7**	**10**	**YES**	**10**
8	**8**	=]	**1**	**9**	**YES**	**9**
10	**10**	Hi there ¶ just trying to keep things equal and honest ¶ now let's get some solid earnings again! :)	**18**	**10**	**YES**	**10**
8	**8**	This is a haiku. ¶ I am glad you trusted me¶ This way we both win!	**13**	**8**	**YES**	**10**
7	**7**		**0**	**8**	**YES**	**8**
9	**9**	Please remember that if you say OUT ¶ you only get $5. I PROMISE you that I will not give you under that if you say IN ¶ I promise.	**28**	**7**	**YES**	**6**
10	**10**	You're in good hands. Win/win.	**5**	**10**	**YES**	**10**
10	**10**	I want to keep this fair and even!	**8**	**10**	**YES**	**10**
10	**10**		**0**	**10**	**YES**	**10**
9	**9**	I'm glad you trusted me and went with IN ¶ I'm gonna do the same thing again so hopefully you go with IN again :)	**24**	**9**	**YES**	**9**
10	**10**	hi. i liked how we did it the first time. hopefully u did too	**14**	**10**	**YES**	**0**
10	**10**	I will send you 10 if you select IN ¶	**10**	**10**	**YES**	**10**
9	**9**	$6 is the minimum offer to accept...anything higher your making more $ just off genorosity	**15**	**10**	**YES**	**6**
10	**10**		**0**	**10**	**YES**	**10**
9	**9**	Good deal! I'll up the transfer a to make it a litte more fair	**14**	**10**	**YES**	**0**
9	**9**	This time I'm going to promise 11 back to you ¶ and since you've seen I keep my promise ¶ when you click IN I will give you back 11 so we both walk out of here with 20. I don't break promises.	**41**	**11**	**YES**	**11**
9	**9**	50/50 ¶ sound good?	**3**	**10**	**YES**	**10**
10	**10**		**0**	**10**	**YES**	**10**
8	**8**	I'll give you exactly what I promise	**7**	**10**	**YES**	**10**
6	**7**		**0**	**10**	**YES**	**8**
10	**10**	just wanted to say hello :) have a nice day!	**9**	**10**	**YES**	**10**
10	**10**	Heyo- happy to work with you again ¶ and do the same thing.	**12**	**10**	**YES**	**10**
10	**10**	Hi! I'm going to split the money evenly. Have a nice day!	**12**	**10**	**YES**	**10**
9	**9**	Let's split it half and half ¶ ten dollars.	**8**	**10**	**YES**	**10**
10	**10**	Hello "A". Based on our last experiment we have established trust ¶ so thanks for making that happen! I will repeat the same steps as last time to ensure that we both get the same amount of money at our maximum level ¶ 10$ each.it makes no sense to betray each other because we just come out of this thing with less money on both parts. Lets get rich!!	**67**	**10**	**YES**	**1**
10	**10**	im going to offer you 10 again ¶ take it and we can profti equally	**14**	**10**	**YES**	**0**
9	**9**	Hey just to let you know ¶ I try my best to never lie in life and I include this experiment part of my life standard so I won't lie.	**29**	**6**	**YES**	**6**
10	**10**	Hey. same amount ¶ same money ¶ we both leave with 27 buck in our pocket. =]	**15**	**10**	**YES**	**10**
10	**10**	Teamwork + Honesty = $$$$¶	**3**	**8**	**YES**	**8**
7	**7**	I Hate Mondays¶ -Garfield	**4**	**17**	**YES**	**16**

10	**10**		**0**	**10**	**YES**	**10**
8	**8**	Hey! So I want to make money ¶ just as much as you do ¶ so why dont we call it even and I promise $10 ¶ you accept ¶ and we get out of here! =D Thanks	**34**	**10**	**YES**	**10**
10	**10**	Pay it forward. ¶ Have a great day.	**7**	**10**	**YES**	**10**
7	**7**		**0**	**7**	**YES**	**7**
10	**10**	Yay! great teamwork last time. I think we should do the same thing again this time. That way we both get the maximum amount of money. Hope that sounds good! :]	**31**	**10**	**YES**	**10**
10	**10**	hi hope your doing well. i plan on doing the same thing as before	**14**	**10**	**YES**	**10**
10	**10**	50-50 :]	**2**	**10**	**YES**	**10**
10	**10**	Same thing?	**2**	**10**	**YES**	**0**
10	**10**	I think we should do $10 each again ¶ works out best for the both of us.	**16**	**10**	**YES**	**10**
9	**9**	Let's do the same...It worked and we both made some money!!!!	**11**	**9**	**YES**	**9**
10	**10**	Hey beautiful. I hopee your having a good day. Truthfully ¶ I'll get you more money if you say IN.	**19**	**10**	**YES**	**8**
9	**9**	well we worked together so far- want to do it again? at least we'll both make more than $5	**19**	**7**	**YES**	**7**
10	**10**		**0**	**10**	**YES**	**0**
9	**9**	i will keep my promise!	**5**	**9**	**YES**	**9**
10	**10**	trust me	**2**	**20**	**YES**	**20**
7	**7**	I'm not quite sure what to say ¶ but hi!:)	**9**	**10**	**YES**	**0**
9	**9**	lets do this!	**3**	**10**	**YES**	**15**
9	**9**		**0**	**10**	**YES**	**10**
9	**9**	same deal.	**2**	**9**	**YES**	**9**
10	**10**		**0**	**10**	**YES**	**8**
9	**9**		**0**	**10**	**YES**	**10**
9	**9**	I'm not entirely sure what I'm supposed to say ¶ BUT point is I promise I will not jip you out of money. What I promise is what you'll get and I hope you will not jip me out of any money either :)	**43**	**9**	**YES**	**9**
6	**6**		**0**	**7**	**NO**	
9	**9**		**0**	**10**	**NO**	
7	**7**	I'm planning on offering the same amount so we can potentially just do the same thing as before	**18**	**7**	**NO**	
8	**8**	choose IN ¶ i will transfer you the promised amount of $	**11**	**9**	**NO**	
8	**8**		**0**	**7**	**NO**	
10	**10**	we need eachother to make money.	**7**	**20**	**NO**	
8	**8**	Hi	**1**	**7**	**NO**	
7	**7**		**0**	**7**	**NO**	
9	**9**		**0**	**8**	**NO**	
8	**8**	We the People of the United States of America, ¶ Inorder to form a more perfect Union, ¶ Do ordain and establish this constitution of the United States...	**24**	**8**	**NO**	
10	**10**		**0**	**5**	**NO**	
6	**6**	I'll promise to transfer whatever amount I say	**8**	**6**	**NO**	