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

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

## **Comments**

Working Paper 14-07

# 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 can 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 emotion surveys 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:* emotions, promises, apologies, trust game, reciprocity, experiments

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## 1. Introduction

In this paper, we explore the role of emotions in regulating cheap signaling, trust re-extension, and trustworthy behavior in the wake of a single trust-based interaction between strangers. 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.<sup>1</sup> 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 Cocharde et al. 2004; Boero et al. 2009; Kaplan et al. 2012). However, investors ceding resources (in anticipation of desired 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.<sup>2</sup> 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.<sup>3</sup> 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. Recalibrational theories of emotions (Tooby & Cosmides 1990; Schniter & Shields 2013; Schniter, Sheremeta & 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

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<sup>1</sup> 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 19<sup>th</sup> 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 results in benefits, resulting in greater trustworthiness (Zak & Knack 2001; Henrich et al. 2001, 2010; Al-Ubaydli et al. 2013).

<sup>2</sup> McNally and Tanner (2011) speculated that under conditions of “an unforgiving Machiavellian society”, one-shot cooperation is most likely to evolve.

<sup>3</sup> 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.

propensity to re-extend trust. We propose that emotions integrate new information about trust-based interaction outcomes, providing hedonic feedback that people experience as either *positively* valenced (motivating continuation of prior behaviors associated with its occurrence) or *negatively* valenced (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 trust has been developed and assured, good feelings are experienced, motivating the trustee to re-affirm the good relationship and demonstrate more trustworthiness, and motivating the investor to trust the trustee's cheap signals and re-extend trust. Alternatively, when a trustee uses cheap-to-produce signals to deceive an investor and generate opportunity for exploitation, the investor and trustee experience negative emotions. An investor's negative emotional reaction to a trustee's untrustworthy behavior motivates a response consisting of distrust of further cheap signals, imposition of costs, and restriction of benefits. A trustee's negative emotional reaction to acting untrustworthy (breaking a promise and exploiting the investor), motivates remedial efforts (e.g., apology) targeting the affected investor – especially when there is possibility of future trust-based exchange opportunity.

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 experiment trustees made non-binding promises of investment-contingent returns, then investors decided whether to invest, and finally trustees decided how much to return. Since sending 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. After an unexpected second game was announced, but before it commenced, trustees could send a one-way message. This design allowed us to observe the endogenous emergence and natural distribution of trust-relevant behaviors, consequent emotions, and focus on these emotions' effects on naturally occurring communication strategies used by trustees, investors' trust re-extension, and trustee's trustworthiness. While results on the observed frequencies of game behaviors in this experiment are reported in Schniter, Sheremeta, and Sznycer (2013), we did not previously examined 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. Theoretical Background**

Despite normative predictions, trust is often developed in experimental one-shot environments with unrelated strangers (e.g., see Dawes & Thaler 1988; Kiyonari et al. 2000; McCabe et al. 2003; Krasnow et al. 2013), especially when facilitated by cheap talk and

emotions (Gambetta 1988; McElreath et al. 2003; Frank 1988, 2004; Ben-Ner & Putterman 2009; Ben-Ner et al. 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.<sup>4</sup> Under such conditions natural selection may have favored those with the propensity to cooperate even when exposed to cues 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 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; Elingsen & 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 et al. 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., 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) – thereby maintaining signal reliability in the society in which it was used.

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<sup>4</sup> Human psychological adaptations for sociality likely evolved under a selective regime characterized by repeated interactions among known others (Kelly 1995).

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 is known to improve cooperation (Orbell et al. 1988; Bohnet & Frey 1999; Ridings et al. 2002; Zheng et al. 2002; Buchan et al. 2006; Cason et al. 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<sup>5</sup>, 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 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.

Recalibrational emotions respond to the presence of adaptive problems resulting from social dilemma outcomes (Schniter & Shields 2013; Schniter, Sheremeta & Shields 2013). In the presence of the appropriate triggers, emotional components such as physiological changes (e.g., arousal), facial expression and posture, subjective experience and action tendencies are produced (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) and voices (Bryant & Barrett 2008; Sauter et al. 2010), supporting the notion that these communicative forms provide fairly reliable indicators of the 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). Frank (1988, 2004) proposed that

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<sup>5</sup> 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.

emotions provide information about people's behavior propensities 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. We evaluate the reported experience of several emotions (appreciation, 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. 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 below. A few studies have also shown that the experience of emotions affects subsequent game behavior (Ketelaar & Au 2003; Fehr & Gächter 2002; Dunn & Schweitzer 2005). However, with the exception of a few studies using deception, the experimental economics literature is silent as to what emotions are experienced and how they inform trust repair and re-extension in subsequent interactions after promises are broken and trust is damaged.

### **3. Experiment Details and Hypotheses.**

#### **3.1. Experiment Details**

The experiment was conducted at Chapman University's ESI laboratory. 458 participants (229 pairs) were recruited from a standard campus-wide subject pool for participation in an experiment that could last up to 45 min. There were 25 experimental sessions. Each session had between 10 and 24 participants. The average experimental earnings were \$18, ranging from a \$0 to \$40, plus \$7 for arriving to the experiment on time and participating. No participant participated more than once, and no participant had prior experience with a similar game environment. During an experimental session, participants seated at visually isolated cubicles interacted with each other anonymously over a local computer network. The experimental procedure, which lasted an average of 35 min total, and did not involve deception, proceeded as follows. Upon arrival, participants in the experiment 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.

Participants then received instructions (see Appendix A) for a single 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. 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, 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.

After the first trust game (game 1) finished, participants were given an emotional status survey 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. The computer software presented all emotional states on one screen and in random order. After completing the survey we gave our participants additional instructions (see Appendix A) indicating that a second trust game (game 2) would follow. In game 2, participants were told they would remain in the same roles and interact with the same partner as in game 1. However, prior to game 2, the trustee was given 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 game in the experimental 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<sup>6</sup> 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

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<sup>6</sup> 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).

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).<sup>7</sup>

### 3.2. Hypotheses

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 indicators of trustworthy character (demonstrated in past word and action). We hypothesize that these demonstrations of trustworthy character trigger emotional reactions in both investor and trustee that better calibrate them for repeated interaction with one another.

Specifically, we predict that when the *signal value* (= return – promise) is negative, the trustee experiences what we refer to as a *promise breaker’s* (*promise keeper’s*) emotional reaction: lower (higher) levels of pride and believability, higher (lower) levels of guilt and shame. When *ROI* (= return/send) is greater than one, the trustee experiences a *beneficent* (*opportunistic*) emotional reaction: feeling higher (lower) levels of pride and believability, lower (higher) levels of guilt and shame. We expect that together the trustee’s *promise breaker* (*keeper*) and *beneficent* (*opportunistic*) 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.

We predict that when the *signal value* (= return – promise) is negative (positive), the investor experiences an emotional reaction to *damaged trust* (*assured trust*) 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 *benefitted* (*exploited*) emotional reaction: feeling lower (higher) levels of anger, disgust, aggravation, frustration, and higher (lower) levels of appreciation, contentment, cheerfulness, and happiness.

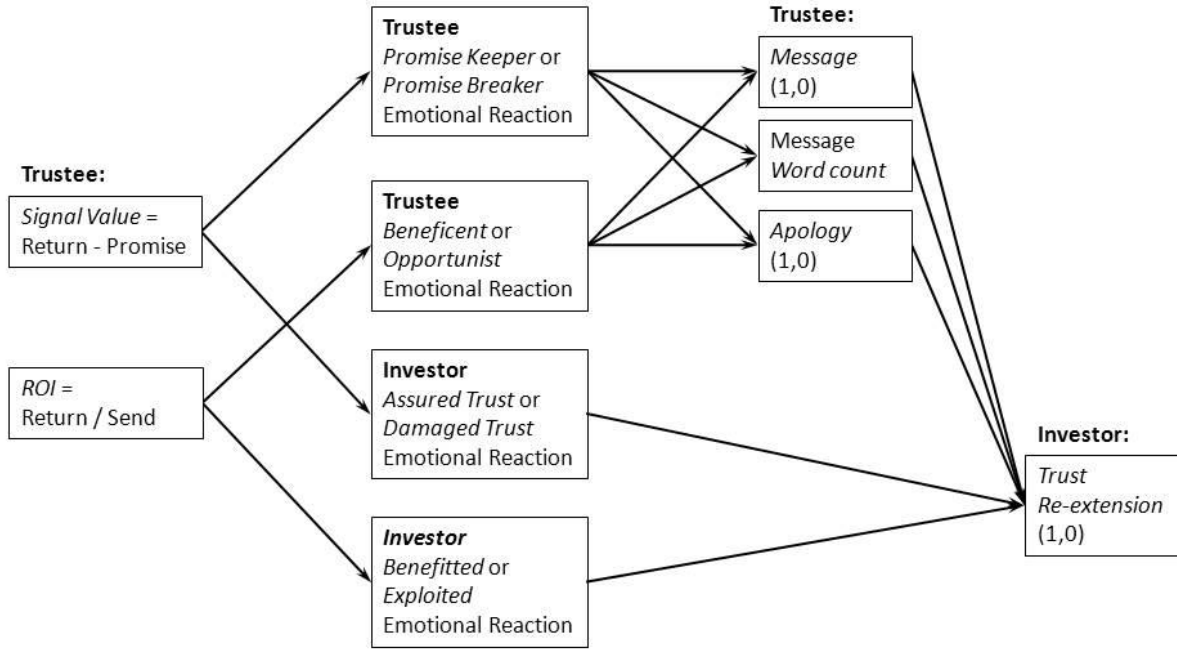
We expect that the propensity to re-extend trust in game 2 is informed by the investor’s emotional reactions to demonstrated trustworthiness, and some assessment of post-exchange re-affirmative and remedial messaging (e.g., whether or not there is a *message* with content, what the *word count* of message is, whether or not an *apology* was issued) by the trustee after the investor’s initial emotional reactions to game 1 interaction outcomes.<sup>8</sup> In Figure 1 we provide a path model visually representing the above predicted relationships between cues of trustworthiness, emotional reactions, messaging behaviors, and the trust re-extension decision.

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<sup>7</sup> 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).

<sup>8</sup> 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.

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 cues (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.



**Figure 1: Path Model of Predicted Relationship between Variables**

## 4. Results

### 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.

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 behavior propensity in subsequent games was not reported. There was substantial variability in individual reports of the emotional states investigated below.<sup>9</sup> The average reported emotional state (as a result of Trust game interactions) 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 remedially, whether investors decide 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 emotions reported by trustees and investors in reaction to game 1 were predicted by demonstrations of trustworthiness (*signal value*, *ROI*) after being trusted (i.e., invested in). As predicted, after game 1 *promise breakers* reported lower levels of pride and feeling believable and higher levels of guilt and shame (than *promise keepers*): 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

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<sup>9</sup> We refer to reports of the following emotional states: proud, believable, guilty, ashamed, angry, disgusted, aggravated, frustrated, appreciative, content, cheerful, happy.

( $t(189) = -7.878, p < .001$ ) in reports of shame between *promise keepers*  $M = 1.06$  ( $SD = 0.346$ ), and *promise breakers*  $M = 1.83$  ( $SD = 1.000$ ).

Also consistent with our prediction of a *beneficent (opportunist)* emotional reaction in trustees, after game 1 *beneficent* trustees delivering  $ROI > 1$  reported higher levels of pride and feeling believable and lower levels of guilt and shame (than *opportunist* trustees delivering lower  $ROI$ s): 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  $M = 1.63$  ( $SD = 1.025$ ).

To evaluate the effect of *signal value* (the difference between game 1 return and promise) on the above emotional reactions we estimated ordered probit models, reported in Table 1. We find that trustee emotions (proud, believable, guilty, ashamed) are predicted by *signal value* of the promise.

**Table 1: Signal Value of Promise and Trustee Emotions**

| Dependent variable      | <i>Proud</i>        | <i>Believable</i>   | <i>Guilty</i>        | <i>Ashamed</i>       |
|-------------------------|---------------------|---------------------|----------------------|----------------------|
| Specification           | (1)                 | (2)                 | (3)                  | (4)                  |
| <i>Return1-Promise1</i> | 0.116***<br>(0.031) | 0.164***<br>(0.028) | -0.138***<br>(0.016) | -0.084***<br>(0.012) |
| Observations            | 191                 | 191                 | 191                  | 191                  |

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

To evaluate the effect of *ROI* (game 1 return divided by promise) on trustee emotional reactions we estimated ordered probit models, reported in Table 2. We find that trustee emotions (proud, believable, guilty, ashamed) are predicted by *ROI*.

**Table 2: ROI and Trustee Emotions**

| Dependent variable     | <i>Proud</i>        | <i>Believable</i>   | <i>Guilty</i>        | <i>Ashamed</i>       |
|------------------------|---------------------|---------------------|----------------------|----------------------|
| Specification          | (1)                 | (2)                 | (3)                  | (4)                  |
| <i>Return1 / Send1</i> | 1.270***<br>(0.343) | 1.739***<br>(0.317) | -1.486***<br>(0.181) | -0.857***<br>(0.141) |
| Observations           | 191                 | 191                 | 191                  | 191                  |

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

#### 4.2.2. Investors: Emotions Predicted by Behavior

As predicted, after game 1 investors with *damaged trust* (where  $\text{return} < \text{promise}$ ) reported higher levels of anger, disgust, aggravation, frustration and lower levels of appreciation, contentment, cheerfulness, and happiness (than investors whose trust was not damaged but *assured* with a  $\text{return} \geq \text{promise}$ ). 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).

Also consistent with our prediction, lower levels of anger, disgust, aggravation, frustration, and higher levels of appreciation, contentment, cheerfulness, and happiness were reported after game 1 by investors who had *benefitted* from a  $ROI > 1$  (as opposed to those *exploited* by lower  $ROI$ ). Among negative emotion experiences there were significant differences ( $t(189) = 12.337, p < .001$ ) in reports of anger between investors who had *benefitted* 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 *benefitted* 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 *benefitted* M = 1.27 (SD = 0.67) and been *exploited* M = 3.45 (SD = 1.438), significant differences ( $t(189) = 11.920, p < .001$ ) in reports of frustration between investors who had *benefitted* 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 from investors who had *benefitted* 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 from investors who had *benefitted* 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 from investors who had *benefitted* 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 from investors who had *benefitted* M = 3.29 (SD = 1.202) and been *exploited* M = 1.36 (SD = 0.790).

To evaluate the effect of *signal value* of promise on the above investor emotional reactions we estimated ordered probit models, reported in Table 3. We find that investor emotions (angry, disgusted, aggravated, frustrated, appreciative, content, cheerful, happy) are predicted by *signal value* of the promise, which explains anywhere from 20% to 43% of the variance in reports.

**Table 3: Signal Value of Promise and Investors' Emotions**

| Dependent variable      | Angry                | Disgusted            | Aggravated           | Frustrated           | Appreciative        | Content             | Cheerful            | Happy               |
|-------------------------|----------------------|----------------------|----------------------|----------------------|---------------------|---------------------|---------------------|---------------------|
| Specification           | (1)                  | (2)                  | (3)                  | (4)                  | (5)                 | (6)                 | (7)                 | (8)                 |
| <i>Return1-Promise1</i> | -0.232***<br>(0.019) | -0.188***<br>(0.017) | -0.208***<br>(0.019) | -0.193***<br>(0.018) | 0.227***<br>(0.029) | 0.209***<br>(0.026) | 0.181***<br>(0.026) | 0.202***<br>(0.026) |
| $R^2$                   | 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. Constants are not reported.

To evaluate the effect of game 1 *ROI* (the amount return divided by the amount sent) on the above investor emotional reactions we estimated ordered probit models, reported in Table 4. We find that investor emotions (angry, disgusted, aggravated, frustrated, appreciative, content, cheerful, happy) are predicted by *ROI* which explains anywhere from 22% to 47% of the variance in reports.

**Table 4: ROI and Investors' Emotions**

| Dependent variable     | Angry                | Disgusted            | Aggravated           | Frustrated           | Appreciative        | Content             | Cheerful            | Happy               |
|------------------------|----------------------|----------------------|----------------------|----------------------|---------------------|---------------------|---------------------|---------------------|
| Specification          | (1)                  | (2)                  | (3)                  | (4)                  | (5)                 | (6)                 | (7)                 | (8)                 |
| <i>Return1 / Send1</i> | -2.684***<br>(0.209) | -2.118***<br>(0.186) | -2.328***<br>(0.205) | -2.171***<br>(0.204) | 2.651***<br>(0.315) | 2.442***<br>(0.279) | 2.129***<br>(0.290) | 2.353***<br>(0.284) |
| $R^2$                  | 0.467                | 0.407                | 0.405                | 0.374                | 0.272               | 0.288               | 0.222               | 0.267               |
| Observations           | 191                  | 191                  | 191                  | 191                  | 191                 | 191                 | 191                 | 191                 |

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

### 4.3. Predictive Emotions

#### 4.3.1. Trustees: Spontaneous Remedial Behaviors Predicted by Emotions

Using regression analysis, we evaluated the effects of trustee's emotional reactions to game 1 on measures of their spontaneous 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. Trustees' feelings of pride showed a significant relationship with *message* ( $X^2 = 4.308$ ,  $p = .038$ ). Trustees feeling believable, guilt, or ashamed were not predictive of *message*.

**Table 5: Trustees' Emotions and Message Sending**

| Dependent variable | Message            | Message            | Message             | Message            | Message            |
|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| Specification      | (1)                | (2)                | (3)                 | (4)                | (5)                |
| <i>Proud</i>       | 0.269**<br>(0.130) |                    |                     |                    | 0.330**<br>(0.146) |
| <i>Believable</i>  |                    | 0.142<br>(0.135)   |                     |                    | 0.121<br>(0.153)   |
| <i>Guilty</i>      |                    |                    | 0.285<br>(0.266)    |                    | 0.558<br>(0.412)   |
| <i>Ashamed</i>     |                    |                    |                     | 0.276<br>(0.366)   | 0.027<br>(0.536)   |
| <i>Constant</i>    | 0.583<br>(0.430)   | 0.982**<br>(0.452) | 1.051***<br>(0.383) | 1.101**<br>(0.457) | -0.759<br>(0.844)  |
| 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. Trustees' feelings of pride did not show a marginally significant relationship with message *word count* ( $p = .799$ ) nor did their feeling believable ( $p = .737$ ). Trustees feelings of guilt showed a significant positive relationship with *word count* ( $\beta = .240$ ,  $t(189) = 3.393$ ,  $p = .001$ ). Likewise, trustees feelings of shame showed a significant positive relationship with *word count* ( $\beta = .174$ ,  $t(189) = 2.430$ ,  $p = .016$ ). Next, we conducted a linear 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* ( $F = 3.695$ ,  $p = .006$ ,  $df = 4$ ). As a set, the four emotions predicted 7.4% of the variance in word count.

**Table 6: Trustees' Emotions and Message Word Count**

| Dependent variable | Word Count           | Word Count           | Word Count          | Word Count          | Word Count          |
|--------------------|----------------------|----------------------|---------------------|---------------------|---------------------|
| Specification      | (1)                  | (2)                  | (3)                 | (4)                 | (5)                 |
| <i>Proud</i>       | -0.182<br>(0.713)    |                      |                     |                     | 0.398<br>(0.786)    |
| <i>Believable</i>  |                      | 0.250<br>(0.744)     |                     |                     | 1.119<br>(0.820)    |
| <i>Guilty</i>      |                      |                      | 3.963***<br>(1.168) |                     | 5.194***<br>(1.891) |
| <i>Ashamed</i>     |                      |                      |                     | 3.938**<br>(1.620)  | -0.448<br>(2.481)   |
| <i>Constant</i>    | 13.452***<br>(2.557) | 12.051***<br>(2.589) | 7.396***<br>(1.880) | 8.112***<br>(2.187) | 1.128<br>(4.403)    |
| Observations       | 191                  | 191                  | 191                 | 191                 | 191                 |

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

**Table 7: Trustees' Emotions and Subsequent Apology**

| Dependent variable | Apology              | Apology              | Apology             | Apology              | Apology              |
|--------------------|----------------------|----------------------|---------------------|----------------------|----------------------|
| Specification      | (1)                  | (2)                  | (3)                 | (4)                  | (5)                  |
| <i>Proud</i>       | -0.547***<br>(0.156) |                      |                     |                      | 0.103<br>(0.240)     |
| <i>Believable</i>  |                      | -0.990***<br>(0.200) |                     |                      | -0.752***<br>(0.248) |
| <i>Guilty</i>      |                      |                      | 1.683***<br>(0.272) |                      | 1.774***<br>(0.447)  |
| <i>Ashamed</i>     |                      |                      |                     | 1.422***<br>(0.320)  | -0.420<br>(0.503)    |
| <i>Constant</i>    | -0.163<br>(0.454)    | 0.839*<br>(0.486)    | 4.606***<br>(0.564) | -3.662***<br>(0.490) | -2.483***<br>(1.066) |
| Observations       | 191                  | 191                  | 191                 | 191                  | 191                  |

Note: \* significant at 10%, \*\*\* 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 showed a significant positive relationship predicting *apology*, ( $X^2 = 13.544$ ,  $p < .001$ ). Trustees' feelings of believable showed a significant positive relationship predicting *apology*, ( $X^2 = 33.109$ ,  $p < .001$ ). Trustees' feelings of guilt showed a significant positive relationship predicting *apology*, ( $X^2 = 56.522$ ,  $p < .001$ ). Likewise, trustees' feelings of shame showed a significant positive relationship predicting *apology*, ( $X^2 = 26.095$ ,  $p < .001$ ). Next, we estimated a probit 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 ( $X^2 = 68.486, p < .001, df = 4$ ). The Cox & Snell  $R^2$  indicates that together the four emotions explain 30.1% of the *apology* variance.

#### **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 remedial behavior demonstrated after game 1.

First, we evaluated whether there was a relationship between each of investors' negative emotional reactions and trust re-extension. Less anger was reported among investors who re-extended trust in game 2 ( $M = 1.51, SD = 1.009$ ) and more anger reported among investors who did not re-extend trust ( $M = 2.57, SD = 1.532$ ), a significant difference ( $t(189) = 4.400, p < .001$ ). Less disgust was reported among investors who re-extended trust in game 2 ( $M = 1.32, SD = 0.857$ ) and more disgust reported among investors who did not re-extend trust ( $M = 2.17, SD = 1.302$ ), a significant difference ( $t(189) = 4.168, p < .001$ ). Less aggravation was reported among investors who re-extended trust in game 2 ( $M = 1.40, SD = 0.929$ ) and more aggravation reported among investors who did not re-extend trust ( $M = 2.43, SD = 1.441$ ), a significant difference ( $t(189) = 4.648, p < .001$ ). Finally, less frustration was reported among investors who re-extended trust in game 2 ( $M = 1.42, SD = 0.851$ ) and more frustration reported among investors who did not re-extend trust ( $M = 2.57, SD = 1.532$ ), a significant difference ( $t(189) = 5.408, p < .001$ ). As predicted, investors who reacted to game 1 with higher the levels of anger, disgust, aggravation, and frustration were less likely to re-extend trust by going IN in game 2. Logistic regression analysis indicated that for game 1 investors who trusted, the negative emotional predictors as a set reliably distinguish between trust re-extension and no trust re-extension ( $X^2 = 20.080, p < .001, df=4$ ). As a set, the negative emotions predicted 10.0% of the variance in trust re-extension.

Next, we evaluated whether there was a relationship between each of the positive emotional reactions and trust re-extension. More appreciation was reported among investors who re-extended trust ( $M = 3.35, SD = 1.406$ ) and less appreciation report among those who did not ( $M = 2.13, SD = 1.486$ ), a significant difference ( $t(189) = -3.861, p < .001$ ). More contentment was reported among investors who re-extended trust ( $M = 3.45, SD = 1.251$ ) and less contentment among those who did not ( $M = 2.35, SD = 1.369$ ), a significant difference ( $t(189) = -3.904, p < .001$ ). More cheerfulness was reported among investors who re-extended trust ( $M = 2.97, SD = 1.283$ ) and less cheerfulness among those who did not ( $M = 1.78, SD = 0.951$ ), a significant difference ( $t(189) = -4.277, p < .001$ ). Finally, more happiness was reported among investors who re-extended trust in game 2 ( $M = 3.20, SD = 1.255$ ) and less happiness among those who did not ( $M = 2.09, SD = 1.345$ ), a significant difference ( $t(189) = -3.963, p < .001$ ). As predicted, investors who reacted to game 1 with higher levels of appreciation, contentment, cheerfulness, and happiness were more likely to re-extend trust in game 2. Logistic regression analysis indicated that the investor's positive emotional predictors (i.e., reactions to game 1) as a

set reliably distinguished between those who re-extended trust a second time in game 2 and those who did not ( $X^2 = 19.459$ ,  $p = .001$  with  $df = 4$ ). As a set, the positive emotions predicted 9.7% of the variance in trust re-extension.

**Table 8: Investors' Emotions, Remedial Behavior, and Trust Re-Extension**

| Dependent variable  | <i>ln2</i>         | <i>ln2</i>          | <i>ln2</i>          | <i>ln2</i>          | <i>ln2</i>         | <i>ln2</i>         | <i>ln2</i>         |
|---------------------|--------------------|---------------------|---------------------|---------------------|--------------------|--------------------|--------------------|
| Specification       | (1)                | (2)                 | (3)                 | (4)                 | (5)                | (6)                | (7)                |
| <i>Angry</i>        | -0.068<br>(0.325)  |                     |                     |                     | -0.067<br>(0.335)  | 0.027<br>(0.342)   | -0.143<br>(0.316)  |
| <i>Disgusted</i>    | -0.062<br>(0.360)  |                     |                     |                     | -0.410<br>(0.395)  | -0.450<br>(0.416)  | -0.263<br>(0.388)  |
| <i>Aggravated</i>   | 0.467<br>(0.516)   |                     |                     |                     | 0.633<br>(0.547)   | 0.356<br>(0.517)   | 0.305<br>(0.516)   |
| <i>Frustrated</i>   | -0.858*<br>(0.471) |                     |                     |                     | -0.856*<br>(0.499) | -0.644*<br>(0.475) | -0.793*<br>(0.481) |
| <i>Appreciative</i> | 0.041<br>(0.307)   |                     |                     |                     | 0.058<br>(0.316)   | 0.101<br>(0.304)   | 0.075<br>(0.309)   |
| <i>Content</i>      | -0.101<br>(0.321)  |                     |                     |                     | -0.036<br>(0.349)  | -0.029<br>(0.332)  | -0.076<br>(0.329)  |
| <i>Cheerful</i>     | 0.570<br>(0.375)   |                     |                     |                     | 0.515<br>(0.392)   | 0.524<br>(0.382)   | 0.578<br>(0.382)   |
| <i>Happy</i>        | 0.013<br>(0.416)   |                     |                     |                     | 0.037<br>(0.417)   | -0.090<br>(0.427)  | -0.011<br>(0.417)  |
| <i>Message</i>      |                    | 1.611***<br>(0.469) |                     |                     | 1.869**<br>(0.572) |                    |                    |
| <i>Word count</i>   |                    |                     | 0.036<br>(0.022)    |                     |                    | 0.051<br>(0.025)   |                    |
| <i>Apology</i>      |                    |                     |                     | -0.560<br>(0.553)   |                    |                    | 1.772*<br>(0.931)  |
| <i>Constant</i>     | 1.795<br>(2.253)   | 2.471***<br>(0.301) | 1.606***<br>(0.299) | 2.086***<br>(0.250) | 2.221*<br>(1.333)  | 1.507<br>(1.264)   | 2.027<br>(1.277)   |
| Observations        | 191                | 191                 | 191                 | 191                 | 191                | 191                | 191                |

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

Next, in Table 8 we report estimation results of probit models predicting the propensity to re-extended trust in game 2 based on investor emotional reactions (to game 1) and a measure of spontaneous remedial behaviors (i.e., either *message*, *word count*, or *apology*). In estimating these models, we do not consider a model with multiple measures of these inter-related remedial behaviors because it would introduce multicollinearity.<sup>10</sup> We can reject the hypothesis that all eight emotions discussed above and in specification (1) have no effect on the likelihood of trust re-extension ( $X^2 = 25.065$ ,  $p = .002$ ,  $df = 8$ , Cox Snell  $R^2 = 0.123$ ). Specification (5) of Table 8 considers these emotions and *message* to predict trust re-extension ( $X^2 = 35.980$ ,  $p < .001$ ,  $df = 9$ , Cox Snell  $R^2 = 0.172$ ). The change in  $R^2$  between specification (5) and specification (1) indicates that *message* explains an additional 4.9% of the variance. Specification (6) of Table 8 considers emotions and *word count* to predict trust re-extension ( $X^2 = 30.490$ ,  $p < .001$ ,  $df = 9$ , Cox Snell  $R^2 = 0.148$ ). The change in  $R^2$  between specification (6) and specification (1) indicates that *word count* explains an additional 2.5% of the variance. Specification (7) of Table 8 considers

<sup>10</sup> *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*.

emotions and *apology* to predict trust re-extension ( $X^2 = 29.432$ ,  $p = .001$ ,  $df = 9$ , Cox Snell  $R^2 = 0.143$ ). The change in  $R^2$  between specification (7) and specification (1) indicates that *apology* explains an additional 2% of the variance.

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

In this section we evaluate whether trustees' emotional reactions to game 1 are predictive of game 2 demonstrations of trustworthiness (game 2 *signal value* and game 2 *ROI*). For previously trusted trustees who were re-extended trust again in game 2, we estimated linear regression models, reported in Table 9, where the dependent variable is game 2 *signal value* (the difference between game 2 return and promise) and the independent variables are the trustee emotional reactions to game 1 (pride, believability, guilt, shame). Trustees' feelings of pride showed a significant positive relationship with game 2 *signal value* ( $\beta = .161$ ,  $t(166) = 2.106$ ,  $p = .037$ ). Trustee feelings of believability also showed a significant positive relationship with game 2 *signal value* ( $\beta = .153$ ,  $t(166) = 1.991$ ,  $p = .048$ ). Trustees feelings of guilt showed a significant negative relationship with game 2 *signal value* ( $\beta = -0.292$ ,  $t(166) = -3.928$ ,  $p < .001$ ). Likewise, trustees feelings of shame showed a significant negative relationship with game 2 *signal value* ( $\beta = -.268$ ,  $t(166) = -3.958$ ,  $p < .001$ ). Next, we conducted a linear regression to evaluate the combined effects of the above four emotional reactions on the *signal value* of promise made in game 2. We can reject the hypothesis that all four emotions (specification 5 in Table 9) have no effect on game 2 *signal value* ( $F = 4.414$ ,  $p = .002$ ,  $df = 4$ ).

**Table 9: Trustees' Emotions and Game 2 Signal Value**

| Dependent variable | Return2-<br>Promise2 | Return2-<br>Promise2 | Return2-<br>Promise2 | Return2-<br>Promise2 | Return2-<br>Promise2 |
|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Specification      | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  |
| <i>Proud</i>       | 0.443**<br>(0.210)   |                      |                      |                      | 0.182<br>(0.226)     |
| <i>Believable</i>  |                      | 0.432**<br>(0.217)   |                      |                      | 0.147<br>(0.234)     |
| <i>Guilty</i>      |                      |                      | -1.381***<br>(0.351) |                      | -0.817<br>(0.585)    |
| <i>Ashamed</i>     |                      |                      |                      | -1.799***<br>(0.501) | -0.720<br>(0.801)    |
| <i>Constant</i>    | -3.027***<br>(0.443) | -2.945***<br>(0.768) | 0.309<br>(0.542)     | 0.575<br>(0.647)     | -0.701<br>(1.242)    |
| Observations       | 168                  | 168                  | 168                  | 168                  | 168                  |

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

Next, we estimate a linear regression model, reported in Table 10, where the dependent variable is game 2 *ROI* (game 2 return divided by game 2 amount sent) and the independent variables are the trustee emotional reactions to game 1. Trustees feelings of pride and believability showed no relationship with game 2 *signal value* ( $p = .641$  and  $p = .641$ , respectively). Trustees feelings of guilt showed a significant negative relationship with game 2 *signal value* ( $\beta = -.169$ ,  $t(166) = -2.214$ ,  $p = .028$ ). Trustees feelings of shame showed a significant negative relationship with game 2 *signal value* ( $\beta = -.157$ ,  $t(166) = -2.046$ ,  $p = .042$ ).

We cannot reject the hypothesis that all four emotions (specification 5 in Table 10) have no effect on *ROI* in game 2 ( $F = 1.345$ ,  $p = 0.256$ ,  $df = 4$ ).

**Table 10: Trustees' Emotions and Game 2 *ROI***

| Dependent variable | Game 2<br><i>ROI</i> | Game 2<br><i>ROI</i> | Game 2<br><i>ROI</i> | Game 2<br><i>ROI</i> | Game 2<br><i>ROI</i> |
|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Specification      | (1)                  | (2)                  | (3)                  | (4)                  | (6)                  |
| <i>Proud</i>       | 0.041<br>(0.039)     |                      |                      |                      | 0.022<br>(0.043)     |
| <i>Believable</i>  |                      | 0.019<br>(0.040)     |                      |                      | -0.015<br>(0.045)    |
| <i>Guilty</i>      |                      |                      | -0.148**<br>(0.067)  |                      | -0.104<br>(0.112)    |
| <i>Ashamed</i>     |                      |                      |                      | -0.194**<br>(0.095)  | -0.074<br>(0.153)    |
| <i>Constant</i>    | 1.547***<br>(0.143)  | 1.622***<br>(0.143)  | 1.881***<br>(0.103)  | 1.911***<br>(0.123)  | 1.886***<br>(0.238)  |
| Observations       | 168                  | 168                  | 168                  | 168                  | 168                  |

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

## 5. Discussion and Conclusion

In this study we examined how participants who were given no indication of subsequent interactions, experienced emotions after participating in a trust game, and how such emotions influenced subsequent behaviors when another opportunity for trust-based exchange arose. We found that emotions triggered by trust-based interaction outcomes are predictable and also predict subsequent messaging, apology, and trust re-extension. 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 (Tooby & Cosmides 1990; Schniter & Shields 2013; Schniter, Sheremeta & Shields 2013). According to this theory, new information about outcomes triggers emotions, and, when experienced, these emotions regulate 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 (re-extend trust) and motivate the *beneficent, promise keeper* trustees to issue shorter re-affirmative messages (word count  $M=6.33$ ,  $SD = 10.970$ )<sup>11</sup> and demonstrate more trustworthiness. Alternatively, a trustee's negative emotional reaction to acting untrustworthy

<sup>11</sup> 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 B.

(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 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 et al. 2001). Our study suggests that cheap-to-produce messages are reliable because they are backed up by emotions. For example, we find that positive emotional responses by trustees decrease the likelihood of apology and the length of message. On the other hand, 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 have access to and understand the dynamics of these emotional responses and communicative intentions should be able to reliably predict the behavior of trustees based on their messages (and by extension, predict the honesty of their messages).

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

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 experience 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 and 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 and Au 2003) gave us encouragement in pursuing measures of self-reported emotions following an economic game. Nevertheless, analysis of variance in emotion reports revealed a “floor effect” that might have resulted from language limitations, difficulty identifying and reporting emotional states, a problem with the instrument used, and untruthful reports.

Consistent with the design of PANAS instruments (Watson et al. 1988) – the most widely used surveys of emotional states, our emotional status survey defined response option “1”, the lowest response possible on the five point Likert, with a label combining two state levels: “not at all” and “very slightly”. By combining both state levels into a single response option, a larger proportion of response types from the possible spectrum (not at all to always) may accumulate at that value, suggesting that the problems of explaining variance in emotional reports might be linked to low-variance floor effects in response patterns. Never the less, we were able to explain more variance among our negative emotions that participants reported lower intensity experience of (than among positive emotions that were reported as experienced more intensely). Future research should consider restructuring the response options and testing whether a different distribution of responses results.

Data quality could also have been affected if participants were primed by the stimulus to experience specific emotions (e.g., as a consequence of experimenter demand) or made 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 participants may not have viewed the emotion survey as “incentive compatible” and thus 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 and 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.

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. Perhaps because of previous confusion or disagreement, the study of emotions has been neglected and deserves greater attention in behavioral economics and interpersonal relationships. By triangulating with more objective neurological, physiological, and behavioral measures of emotional states some of the discussed limitations of itemized self-reports could potentially be overcome. This study provides evidence that consequences of the behaviors we choose and experience predict the emotions we feel and that, in turn, the emotions we feel influence our propensity towards subsequent behaviors. These findings suggest that there is hope for a future where people better understand the role that emotions play in relationships.

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## Appendix A: Instructions for the Trust Game

### 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.

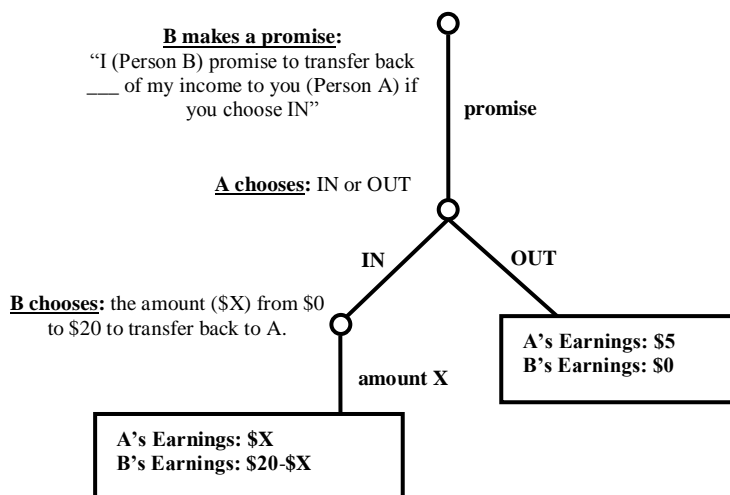
Having received a statement from B, A indicates whether he or she chooses IN or OUT. If A chooses OUT, A receives \$5 and B receives \$0. If A chooses IN, then B receives \$20 income. In such a case, after receiving \$20 income, B must choose a dollar amount from \$0 to \$20 to transfer back to A.

### 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 part of the 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: Promises and Messages

**Table B1: 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 muneey 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 honest 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 apologies 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 B2: 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 roommate snores away. Hahaha. ¶ Cha-ching ly ¶ B.¶  | 16         | 4               | YES             | 4               |

|           |  |           |           |            |           |
|-----------|--|-----------|-----------|------------|-----------|
| <b>20</b> | if i say \$20 and you accpet ₪ I promise to give you \$20 back so we both leave with \$20 ₪ the max amount   | <b>23</b> | <b>20</b> | <b>YES</b> | <b>20</b> |
| <b>8</b>  | I promise to uphold any deals set before me  | <b>9</b>  | <b>10</b> | <b>YES</b> | <b>10</b> |
| <b>6</b>  | 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.   | <b>33</b> | <b>7</b>  | <b>YES</b> | <b>7</b>  |
| <b>8</b>  |  | <b>0</b>  | <b>10</b> | <b>YES</b> | <b>0</b>  |
| <b>5</b>  | 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! :) | <b>83</b> | <b>5</b>  | <b>YES</b> | <b>0</b>  |
| <b>10</b> | If I offered you 10\$ why would you rather get 5?  | <b>11</b> | <b>10</b> | <b>YES</b> | <b>10</b> |
| <b>6</b>  | 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!  | <b>28</b> | <b>6</b>  | <b>NO</b>  |           |
| <b>5</b>  | hey Participant a make a deal dont do like this we should come here to earn money kul  | <b>18</b> | <b>1</b>  | <b>NO</b>  |           |
| <b>10</b> | dont be an asshole   | <b>4</b>  | <b>7</b>  | <b>NO</b>  |           |
| <b>10</b> | Trust me.  | <b>2</b>  | <b>10</b> | <b>NO</b>  |           |
| <b>6</b>  | You'll get more than \$5.  | <b>5</b>  | <b>8</b>  | <b>NO</b>  |           |
| <b>8</b>  | 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. :)   | <b>58</b> | <b>7</b>  | <b>NO</b>  |           |



**Table B3: 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 generosity   | 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 profit 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  |    |