Faculty Research

University of Michigan Business School

WORKING PAPER SERIES

Inducing Fear and Anger in a Fast-Paced, Electronic Bargaining Environment 1 Running Head: Inducing Fear and Anger in a Fast-Paced, Electronic Bargaining Environment

Inducing Fear and Anger in a Fast Paced, Electronic Bargaining Environment

Faison P. Gibson
University of Michigan Business School

Working Paper 03-012

Running head: Inducing Fear and Anger in a Fast-Paced, Electronic Bargaining Environment

Inducing Fear and Anger in a Fast-Paced, Electronic Bargaining Environment

Faison P. Gibson

University of Michigan Business School

701 Tappan Street

Ann Arbor, MI 48109-1234

office: 734-647-9200

fax: 734-764-3240

fpgibson@umich.edu

ABSTRACT

Emotion is increasingly recognized as an important factor in decision making and is also increasingly being experimented with as an element in information systems. For instance, interfaces designed to stimulate emotion are finding their way into bargaining web-sites, robots, and battlefield training simulations. This paper presents hypotheses for how two specific emotions, fear and anger, induced by information systems may be used to influence decision behavior in fast-paced environments. The hypotheses were tested using thirty-three subjects in a contentious, computer-mediated bargaining task where the two emotions were induced midway through a series of negotiations. As hypothesized, after the emotions induction, angry subjects demanded harsher terms and made more threats immediately after the emotion induction while afraid subjects backed down on the terms they demanded and made fewer threats immediately after the emotion induction. These results suggest that information systems designers should continue to investigate and use emotion as an important new tool for guiding decision behavior.

Inducing Fear and Anger in a Fast-Paced, Electronic Bargaining Environment

Over the past decade, researchers in information systems have adopted cognitive frameworks to explain how decision makers perform using information systems and how these systems may be better designed to influence their behavior. For instance, the effort-accuracy framework has been used to show how using a decision support system to vary the effort required to execute given decision strategies influences strategy selection (Todd & Benbasat, 1991, 1999, 2000), how congruence between information presentation and decision task demands affects the speed of decision making (Jarvenpaa, 1989), and how cognitive capacity affects the ability to make effective decisions in real-time environments (Lerch & Harter, 2001). Researchers have also used cognitive theories to show how decision support systems may be used to improve learning from feedback during fast-paced repeated decisions (Davis & Kottemann, 1995; Gibson, 2000; Sengupta and Abdel-Hamid, 1993). However, despite this progress, cognitive approaches do not address many of the variables that organizations have at their disposal to influence decision makers (e.g., Todd & Benbasat, 1991, p. 109).

Emotion appears among the most important of these. Recent evidence suggests emotion plays an important role in motivating consumption decisions (Loewenstein, 1996), employment decisions (Luce, Bettman, & Payne, 1997), and preferences for gambles (Mellers, Schwartz, & Ritov, 1997, 1999). Intuitively recognizing emotion's influence, organizations have long encouraged decision makers in fast-paced, interactive environments to adopt emotions to influence their decision behavior. Sales

representatives and clerks are encouraged to adopt cheerful emotions on the belief that these emotions will motivate them to be more courteous, promoting higher sales (Hochschild, 1983; Rafaeli, 1989; Rafaeli & Sutton, 1987). Credit collectors are encouraged to feel annoyance, even anger, toward debtors lest they become motivated by pity or empathy to soften their demands on them (Rafaeli & Sutton, 1991; Sutton, 1991). More recently recognizing emotion's importance, designers of fast-paced electronic decision environments, such as bargaining web-sites and battlefield simulation trainers, have begun to incorporate interfaces meant to stimulate emotion (Hafner, 2001; Slatalla, 2000). Decision makers in fast-paced environments may be particularly susceptible to emotion's influence because they have less time to deliberate, forcing them to rely on internal biases such as may be produced by emotions (Bechara, Tranel, & Damasio, 1997; Loewenstein, 1996).

How can information systems designers harness emotions to guide decision behavior in fast-paced environments? Although, as just noted, emotional interfaces have begun to appear in fast-paced, electronic decision environments, the actual impact of emotion on decision making in these environments has received scant attention. To begin to address this issue, I propose an extension to Schwarz and Clore's emotion-as-information hypothesis (Hertel, 1999; Hertel, Neuhof, Theuer, & Kerr, in press; Raghunathan & Pham, 1999; Schwarz, 1990; Schwarz & Clore, 1983). In the emotions-as-information hypothesis, individual decision makers use their feelings at the moment as a source of information regarding their well-being (Raghunathan & Pham, 1999; Schwarz, 1990). In the extension developed here, decision makers' emotions further act as a biasing influence on how they interpret causality, their own capacities, and the options available. For instance anger indicates that a specific

person has committed a wrong and that it is within the decision maker's control to right that wrong (Smith & Ellsworth, 1985), possibly by punishing the transgressor (Goldberg, Lerner, & Tetlock, 1999). Fear indicates that the decision maker does not have a high degree of control over a risky situation, suggesting retreat (Lang, 1995; LeDoux, 1996; Lerner & Keltner, 2000; Smith & Ellsworth, 1985). When an information system is used to induce these emotions in fast-paced decision environments, decision makers may both appraise the situation as suggested by the emotion and allow emotion-motivated goals to guide their behavior.

The next section further develops this theoretical framework. After that, I describe a computer-mediated bargaining experiment where subjects were induced to feel either anger or fear midway through. Anger and fear were examined because there is increasing evidence concerning their effects (e.g., Goldberg et al., 1999; Lerner & Keltner, 2000; Smith & Ellsworth, 1985), and they are emotions frequently observed in fast-paced, interactive decision environments (e.g., Rafaeli & Sutton, 1991). The results, indicating that angry subjects harshened their bargaining terms while afraid subjects backed down, suggest that emotions induced by information systems may have a significant impact on repeated decisions in fast-paced environments. This report concludes by noting limitations of the work described, how the theory might further be extended, and implications for designing electronic decision environments.

EMOTION AND DECISION MAKING

Emotions are complex feeling states, with associated changes in physiological activity, that broadly direct decision makers' situation appraisals and promote action tendencies (Izard, 1993; Keltner, Ellsworth, & Edwards, 1993; Lang, 1995; LeDoux, 1996; Schachter & Singer, 1962). Researchers generally identify 6–8 basic emotions

including: fear, anger, joy, sadness, acceptance, disgust, expectation, and surprise, with other emotions hypothesized to represent combinations of these (Plutchik, 1993). Several recent findings from emotion and decision research provide a theoretical basis for predicting emotion's impact in fast-paced, repeated decision tasks.

First, decision makers interpret emotional pleasantness as information concerning preference and well-being. Preferences for gambles (Mellers et al., 1997, 1999), career options (Luce et al., 1997), and risky choices in general appear at least partially mediated by how pleasant the decision maker anticipates the outcomes (Loewenstein, Weber, Hsee, & Welch, 2001). Further, decision makers use their emotions as information in these judgments, even if the emotions come from an irrelevant source. Schwarz and Clore (1983) asked their subjects to provide judgments of their life satisfaction and found a consistent impact for subjects' emotional state at the moment the question was asked. Subjects experiencing more unpleasant moods at the time of the question rated their overall life satisfaction lower than subjects experiencing more pleasant moods.

Second, specific negative emotions such as anger and fear, systematically bias decision makers' situation appraisals along additional well-defined dimensions beyond pleasantness (Goldberg et al., 1999; Keltner et al., 1993; Lerner, Goldberg, & Tetlock, 1998; Lerner & Keltner, 2000; Smith & Ellsworth, 1985). In the case of anger and fear, these dimensions include: (1) the decision maker's personal sense of control over the situation at hand; (2) whether the source of problems is due to another's actions; and (3) the decision maker's overall sense of certainty (Goldberg et al., 1999; Keltner et al., 1993; Lerner & Keltner, 2000; Smith & Ellsworth, 1985). In terms of these appraisal dimensions, angry decision makers are more likely to have a higher sense of certainty

and to feel in control of a situation where someone else has done wrong. Using this characteristic appraisal pattern to predict behavior, researchers have shown that: (1) the higher sense of certainty associated with anger can be used to infer that angry decision makers will be less risk aware leading them to predict lower frequencies for hazards (Lerner & Keltner, 2000); and (2) the tendency to identify a wrong-doer and feel in control of the situation can be used to infer that angry decision makers will be more punitive toward defendants in legal proceedings and bargainers who make unfair offers (Goldberg et al., 1999; Pillutla & Murnighan, 1996).

Researchers have given little or no attention to fear's tendency to bias situation appraisals toward reduced feelings of control and not identifying a wrong-doer. However, the lowered sense of certainty associated with fear has been used to infer that afraid decision makers will be more aware of risk and therefore likely to: (1) predict higher frequencies for hazards (Lerner & Keltner, 2000); and (2) prefer less risky, lower pay-off gambles (Raghunathan & Pham, 1999). .

Thus, an important effect of emotions on decision makers is to bias their situation appraisal and thereby their action selection, even when they ostensibly have time to deliberate. Further, in the case of anger and fear, these biases are specific and in opposite directions. In fast-paced, interactive tasks the biasing influence of emotion on appraisal and action should be similarly strong if not stronger because, with less time to deliberate, decision makers are more likely to rely on information that is immediately available (Bechara et al., 1997; Loewenstein, 1996). However, fast-paced, interactive tasks involve repeated decisions over time, and both of these factors may attenuate emotion's influence (Schwarz & Bohner, 1996).

First, as regards the impact of repeated decisions, evidence from single decision

tasks indicate that emotions can be dissipated and their influence on decision makers' appraisals eliminated when their root cause is resolved. Goldberg and her collaborators found that when the object of anger in an earlier vignette was punished, subjects were less likely to be influenced by anger in setting the punishment in a later vignette (Goldberg et al., 1999).

Second, emotional influences may be attenuated by the simple passage of time. Fredrickson and her collaborators found the impacts of fear and anger on cardiovascular reactivity lasted from 27 seconds to 62 seconds after the emotion induction ended (Fredrickson et al., 2000; Fredrickson & Levenson, 1998). Thus, although we might expect emotion's influence to be accentuated in fast-paced tasks, the duration of this influence may be limited due to resolution of the source of the emotion or the natural dissipation of emotion over time.

To address the issue of how anger and fear impact fast-paced, repeated decisions, this study examined the effects of inducing subjects to feel these emotions half way through a series of eight negotiations using the credit collections task described next. Angry subjects were expected to become harsher in their demands and to issue more threats. Afraid subjects were expected to make less harsh demands and to issue fewer threats. The time course of these effects was left to empirical observation. The next section describes the collections task. Immediately after that, the theoretical elements just elaborated are used to derive more specific hypotheses concerning subjects' behavior in the experiment.

Collections Task

Figure 1 shows the collections task, the fast-paced decision task used in this study. It is a bargaining game in which subjects play the role of credit collectors who

are put in contact with debtors behind on their credit card payments. In each contact with a debtor, collectors make a series of twelve offers, and the debtor responds to each offer by either accepting or rejecting. Unbeknown to subjects, the debtors are actually computer algorithms programmed to respond in particular ways to their offers. The task and its parameters were derived from reported observations within collections call centers and prior research conducted by a number of authors (Gibson, Fichman, & Plaut, 1996; Hochschild, 1983; Sutton, 1991).

Insert Figure 1 about here

In the task instructions, subjects were informed that their goal was to get debtors to pay as much money in as little time as possible every time they made an offer. Subjects were also instructed that, if debtors did not accept their offers, they should compromise by offering to wait more days for payment, accepting smaller payments, or some combination of the two. No preference was given for the dimension on which they should compromise. Subjects were further instructed that they should try threats and encouragements and determine for themselves which were more effective.

Figure 1 shows the interface used for bargaining during contacts between subjects and debtors. During each contact, subjects made twelve offers within a time limit of four seconds per offer, thereby conforming with observations of offer quantity and frequency in a functioning collections environment (Gibson et al., 1996). Even if debtors accepted an offer before the subject had made twelve offers, subjects had to keep making offers until the end of the contact to ensure that the debtor was sincere in accepting and to ensure they could not get a better deal. In the United States, where

telephone solicitors are told not to take no for an answer, such aggressive tactics have long been observed (Hochschild, 1983). In such negotiations, it is not uncommon for previously rejected offers to be reproposed or for previously accepted offers to be rejected. Given the task parameters (described below), there was a probability of 0.86 in any given contact consisting of 12 offers that at least one offer in a previously acceptable range would be rejected or vice versa.

To make an offer, subjects clicked on a dollar amount (between $100 and $500 or $150 and $750), a number of days (between one and ten) in which the dollar amount had to be paid, and either an encouragement or a threat (encouragement: "Pay, it will get you back on track!"; threat: "Pay, otherwise legal action may be taken!"), with all choice options counterbalanced. Once subjects completed their selections, they clicked on the button labeled Talk. A female voice then stated the subject's offer to the debtor, including the threat or encouragement. A male voice responded as the debtor by saying "Accept" or "Reject", and a dot appeared in the appropriate position for that speaker turn in the Debtor's Bargaining Position Graph shown in Figure 1.

The debtors' responses were derived through a two-step process. First the debtor's reservation price (*Reservation*) was calculated using the following equation:

$$Reservation = (Days\_Offered - 8)\,(Min\_Value) \quad (1)$$

where *Days_Offered* was the number of days the subject offered, and *Min_Value* was either $100 or $150, depending on what the minimal acceptable value was for that contact.

Then the debtor responded "Accept" or "Reject" using the following simple

decision rule based on *Reservation* from Equation (1):

$$Response = \begin{cases} \text{Accept with 85\% probability} & , \quad Dollar\_Offer \leq Reservation \\ \text{Reject with 85\% probability} & , \quad Dollar\_Offer > Reservation \end{cases} \tag{2}$$

where *Dollar_Offer* was the subject's dollar offer. Examining Equations (1) and (2), it is apparent that only three offers had a high likelihood of acceptance: *Min_Value* in 9 days, *Min_Value* in 10 days, or 2 (*Min_Value*) in 10 days. Note further that subjects' threats and encouragements had no effect either on the debtor's reservation price or decision rule.

Hypotheses

Hypotheses were developed regarding term harshness and use of threats. We start with term harshness. Term harshness was conceptualized as the difference between subjects' dollar offer for a given number of days and debtors' reservation price for that offer per Equation (1). Two features of anger's characteristic appraisal pattern were predicted to bias decision makers to ask for harsher terms after they became angry. First, lowered risk awareness (Lerner & Keltner, 2000) could have led decision makers to be less aware of the risk that harsher terms would fail and therefore more willing to try for harsher terms, as suggested by the task instructions.

Second, decision makers' identification of a wrong-doer and their sense that it was in their power to rectify the situation could have made them more likely to actively attempt to punish the wrong-doer as observed in judicial contexts (Goldberg et al., 1999) and bargaining tasks where partners made inequitable distributions (Pillutla & Murnighan, 1996). In the collections task, debtors committed a wrong by reneging on their debt. Since asking for more dollars, fewer days, or both were clearly

against the debtor's stated preferences, asking for harsher terms was clearly a means of punishment available to decision makers.

Therefore, given these two convergent lines of reasoning, Hypothesis 1 was stated as follows:

> H1: After subjects become angry, they will ask for harsher terms brought about by increases in the dollars component of their offer, decreases in the days component of their offer, or both.

Two features of fear's characteristic appraisal pattern led to the prediction that afraid subjects would offer less harsh terms. First, increased feelings of uncertainty could have led to higher awareness of the risk of harsher terms failing (Lerner & Keltner, 2000; Raghunathan & Pham, 1999). Since subjects were told they could increase their chance of succeeding by lowering the dollar amounts they asked for or increasing the number of days, higher risk awareness should have led to less harsh terms.

Second, feelings of loss of control could have also led subjects to retreat from asking for harsher terms (Blanchard & Blanchard, 1989; Lang, 1995). Although feelings of loss of control are normally highly correlated with risk awareness, they are conceptually different. Loss of control implies doubt in one's personal effectiveness in a given situation, while heightened risk awareness applies to one's judgments concerning the likelihood of outcomes. In the collections task, loss of control could have led decision makers to ask for less harsh terms because they felt less confident in their ability to make the debtor pay.

Again, given two convergent lines of reasoning, Hypothesis 2 was stated as follows:

H2: After subjects become afraid, they will offer less harsh terms brought about by decreases in the dollars component of their offer, increases in the days component of their offer, or both.

Hypotheses 1 and 2 do not allow us to differentiate the impact of the different appraisal dimensions of fear and anger because these dimensions are highly correlated in how they might bias term harshness. However, the dimensions are less correlated in their implications for threats and encouragements.

From the perspective of risk awareness, both threats and encouragements should increase the likelihood that offers will be accepted. Threats increase the perceived cost of not agreeing to the offer, while encouragements highlight the potential benefits of the offer making it more attractive. Given this observation, increased risk awareness does not make a clear prediction for change in the use of threats by either angry or afraid subjects. In the case of angry subjects, decreased risk awareness could not simultaneously drive them to both take risks by asking for harsher terms and reduce risk by using threats or encouragements. In the case of afraid subjects, increased risk awareness could have led them to provide more encouragements, more threats, or both as they attempted to reduce the risk of their offers failing.

However, differences between afraid and angry subjects in sense of control and identification of a wrong-doer yield different, clearer predictions for the use of threats. If angry subjects' stronger sense of control and clear identification of a wrong-doer led them to have more of a propensity to punish, then threats, with their promise of further punishment, would have logically increased after subjects became angry. If afraid subjects felt increased loss of control, and by implication less personally effective, then threats, a controlling, self-confident behavior, should have decreased

after subjects became afraid. Therefore, based on divergent lines of reasoning, Hypotheses 3 and 4 were stated as follows:

H3: After subjects become angry, they will increase their use of threats.

H4: After subjects become afraid, they will decrease their use of threats.

EXPERIMENT

The following experiment using the collections task was conducted to test these hypotheses. It used a 2 X 2 design with one between-subjects factor, whether subjects were induced to feel fear or anger half way through the experiment, and one within-subjects factor, before and after the emotion induction.

Method

The experiment consisted of the following main activities:

- Subjects completed contacts with four debtors, providing an indication of their bargaining behavior prior to the emotion induction.
- Subjects were then induced to feel fear or anger by intensively remembering an experience in which they felt that specific emotion.
- Finally, subjects completed contacts with another four debtors to provide a measure of bargaining behavior after the emotion induction.

Detailed Procedure

Thirty-three undergraduate subjects were paid $10 apiece to participate in the experiment. When subjects arrived, they were told that they would bargain via computer with 8 separate debtors who were behind on their credit card payments.

Further, the experiment would pause in the middle, after contact with the fourth debtor, for "data analysis". During that time, subjects would complete the life events inventory, an unrelated task for another experimenter who was taking advantage of the subjects' availability to test some new ideas.

After receiving this overview, subjects completed the following sequence of activities. First, they filled out emotion self-report scales (detailed below) that they were told would be helpful in understanding their responses to the life events inventory later in the experiment. Next, subjects were instructed in the collections task, and they made contact with the first four debtors. After subjects completed the fourth debtor contact, the experiment paused for the purported data analysis. At this point, subjects completed the life events inventory in which they detailed an experience that made them feel intensely afraid (fear) or enraged (anger), and they again filled out the emotion scales. When subjects had completed the life events inventory and emotion scales, the pause for data analysis was indicated as over, and subjects made contact with the final four debtors.

Contrary to the information provided to subjects, the purported filler task, the life events inventory, constituted the experimental manipulation. To ensure sufficiently extensive recall to re-evoke the emotion (Schwarz & Clore, 1983), subjects were required to answer five 100 word essay questions about the event that made them feel either enraged (anger) or very afraid (fear; see Appendix A for the specific wording of the questions).

Self-Report Emotion Scales

The study used two self-report emotion scales, the Positive Affect Negative Affect Scale (PANAS) and the Affect Grid (Russell, Weiss, & Mendelsohn, 1989; Watson,

Clark, & Tellegen, 1988). In the PANAS, subjects rated how they felt on a scale of one to five ("not at all" to "very much") for the following 20 emotion words (in randomized order): active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, strong, afraid, ashamed, distressed, guilty, hostile, irritable, jittery, nervous, scared, and upset. The first ten of these words, active through strong, load highly on positive affect and the second 10, afraid through upset, load highly on negative affect. As may be evident from the words, positive affect reflects the extent to which subjects felt enthusiastic, active, and alert. Negative affect indicates the degree to which subjects were experiencing distress and displeasurable engagement.

The Affect Grid provided a confirmatory measure of emotion where subjects simultaneously rated themselves on how pleasant they felt (valence) and their degree of wakefulness (arousal) by clicking on a nine-by-nine grid (Russell et al., 1989). The x-axis of the grid was for valence ranging from very unpleasant to very pleasant, and the y-axis was for arousal ranging from completely unaroused to highly aroused.

Inducing anger and fear should have elicited more negative affect without difference between subjects (Watson et al., 1988). As measured by the Affect Grid, afraid and angry subjects should have both felt less pleasant with no difference between subjects (Lang, 1995; Russell et al., 1989).

Predictions can also be made for changes in how subjects rated themselves on individual words of the negative affect scale. First, hostile is highly correlated with the extent to which people feel anger (Lemerise & Dodge, 1993). Angry subjects should have increased in hostility with no predicted change for afraid subjects. Second, the words afraid, jittery, and scared are associated with the extent to which people felt fear. Afraid subjects should have increased on these items while angry subjects,

feeling more certain and in control with lowered risk awareness, should have decreased.

Content of Subjects' Recall in the Life Events Inventory

Solely using self-report scales to measure emotions can be problematic. Even if subjects were under the influence of emotional processes, they might not have been sufficiently aware of this influence to provide a reliable self-report (Izard, 1993). Further, even if subjects were explicitly aware of their feelings, there are societal taboos against expressing certain negative feelings such as anger, hostility, or fear (e.g., Hochschild, 1983). For these reasons, this study supplemented self-ratings on emotion scales with independent analyses by third parties of how subjects appraised the situation that made them feel either afraid or angry in Question 1 of the life events inventory. This question was chosen because it asked subjects to summarize the elements of the situation that led them to feel the emotion. Self-reports indicating that subjects' emotions changed in the predicted direction after the life events inventory and independent evaluations that subjects' appraisals were characteristic of the designated emotion provide convergent evidence of the life events inventory's effectiveness in inducing that emotion.

The two appraisal dimensions distinguishing anger and fear that should have been most readily apparent in the content of subjects' life events inventory statements are loss of control and identification of a wrong-doer (Scherer, 1988; Smith & Ellsworth, 1985). Although the two emotions also differ in terms of certainty or risk awareness, the expression of such sentiments in a recalled personal experience, is likely to be highly confounded with loss of control. Subjects describing experiences in which they felt fear should have made statements indicating a loss or potential loss of

personal control over events. Subjects experiencing anger should have made fewer of these statements because angry people feel that they can do something to rectify the course of events (Keltner et al., 1993). By counter, angry subjects should have made more statements assigning blame to identified wrong-doers (Goldberg et al., 1999; Smith & Ellsworth, 1985).

In the analyses performed to identify whether these patterns existed in subjects' answers to Question 1, subjects' paragraphs were divided into individual statements, each expressing one thought (Krippendorf, 1980). Then, each statement was assigned exclusively to one of the three mutually exclusive codes in Figure 2 by two independent raters.

Insert Figure 2 about here

As indicated in the figure, the code LC indicated that the subject was expressing a feeling of losing control in a bad situation. The code was specifically applied to: (1) statements that something bad was about to happen that was not explicitly someone's fault nor in the control of the subject; or (2) to expressions of isolation or worry. The code AB indicated that the subject was explicitly assigning blame to a specific person for doing something wrong or causing a bad outcome. The code O was applied to all other statements.

Two independent coders were trained to apply these codes and then independently rated the 33 responses (Krippendorf, 1980). Kappa, a measure of inter-rater reliability that corrects for chance agreement was used to assess the rate of agreement between the coders (Fleiss, 1981). Kappa ranges between 0 and 1 and was

0.82 for the two coders used in this study, indicating excellent agreement (Fleiss, 1981).

Results and Analyses

We first check that subjects experienced a change of emotions between the start of the task and the life events inventory. Then, we focus on the hypotheses.

Questions regarding differences between afraid and angry subjects were resolved using standard t-tests. However, tests of effects within subjects and the interaction of these effects with their emotion condition involved repeated, non-independent measures within subjects, violating standard statistical assumptions. To resolve this problem, single, independent contrast scores of each subject's change in performance were created by subtracting the subject's average performance before the life events inventory from their average performance after the life events inventory (Judd & McClelland, 1989). Using this approach, testing for an overall increase or decrease in performance after the life-events inventory was achieved by regressing the individual contrast scores on the intercept (equivalent to testing whether the average contrast score was significantly different from 0, Judd & McClelland, 1989, Chapter 14). An interaction with the emotion induced (e.g., did angry and afraid subjects respectively increase and decrease their dollar requests?) was tested by regressing the contrast score against the condition, with fear coded as -1 and anger coded as 1 (equivalent to testing whether the average contrasts for the two groups were different from each other and in which direction). All results with repeated measures are reported using this method, commonly referred to as 1 *df* contrasts. When used in cases where all observations are independent, analyses using 1 *df* contrasts yield equivalent results to standard ANOVA (Judd & McClelland, 1989, Chapter 10).

Manipulation check—content analysis and emotion measures

An informal examination of subjects' responses to the life events inventory indicates that angry subjects tended to recall a personal situation such as dispute with a significant other or a racist incident in which they felt they were wronged. Afraid subjects tended to recall experiences where they lost control with negative consequences such as an accident. Although instructed to recall events unrelated to the experiment, two angry subjects and one afraid subject recalled interactions with the computerized debtor.

Figure 3 shows the average number of statements coded as LC or AB per subject by emotion condition. The content of the situations described by angry and afraid subjects differed significantly. Afraid subjects described situations in which they mentioned loss of control (statements coded LC) significantly more often than angry subjects($t_{31} = 6.77$, $p < 0.001$), and angry subjects assigned blame for wrong doing (statements coded AB) significantly more often than afraid subjects ($t_{31} = 5.37$, $p < 0.001$).

Insert Figure 3 about here

Figure 4 shows emotion measures by condition and contact group before and after the life events inventory. As apparent in Figure 4, after the life events inventory, all subjects experienced significantly more negative affect than they had at the start of the experiment ($t_{31} = 2.51$, $p < 0.02$) with no difference in the change between subjects ($t_{31} = 0.35$, $p > 0.73$). Concurring with the results for negative affect, after the life events inventory, all subjects felt marginally less pleasant than at the start of

the experiment ($t_{31} = -1.93$, $p < 0.06$) with no difference in the change between angry and afraid subjects ($t_{31} = -0.81$, $p > 0.42$).

Insert Figure 4 about here

As indicated by the significant interaction term for hostility ($t_{31} = 2.54$, $p < 0.02$), angry and afraid subjects experienced different changes in hostility, with angry subjects increasing in hostility and afraid subjects not changing. Further, angry and afraid subjects experienced marginally different changes in feeling jittery ($t_{31} = -1.86$, $p < 0.07$) with afraid subjects increasing and angry subjects decreasing. Interactions for afraid and scared were not significant.

In summary, the content of afraid and angry subjects' recall during the life events inventory differed significantly causing them to report generally more negative feelings afterward with different changes between the two groups in how hostile and jittery they felt.

Bargaining behavior

Since the range of dollar values subjects could use in formulating their offers ($100–$500 or $150–$750) did not have a significant effect on their behavior, reporting is simplified by presenting all dollar amounts normalized to the range $100–$500.

Figure 5 shows subject bargaining behavior. The top portion of the figure shows term harshness, the average difference between subjects' offers and debtors' reservation prices computed using Equation (1), for each of the eight contacts. Positive values for term harshness indicate that subjects were offering combinations of dollars

and days that only had a 15% chance of acceptance because they exceeded the debtors' reservation price. However values of term harshness less than or equal to 0 indicate that subjects' offers had an 85% chance of acceptance. The table in the lower half of Figure 5 shows term harshness as well as dollars offered, days offered, and negative education by condition and contact group.

Insert Figure 5 about here

Hypotheses 1 and 2 were tested jointly as the interaction of the emotion condition (afraid or angry) with the change in bargaining behavior subjects showed after the life events inventory. Conforming with Hypotheses 1 and 2, angry subjects increased the harshness of their terms after the emotion induction while afraid subjects decreased theirs ($t_{31} = 2.69$, $p < 0.02$). Angry subjects increased the dollar component of their offers while afraid subjects decreased theirs ($t_{31} = 2.99$, $p < 0.01$). Finally, angry subjects marginally decreased the days component of their offers while afraid subjects marginally increased theirs ($t_{31} = -1.82$, $p < 0.08$).

These differences in how subjects changed their behavior caused them to bargain significantly differently after the life events inventory. After the life events inventory, angry subjects asked for harsher terms than afraid subjects ($t_{31} = 2.85$, $p < 0.01$). Further, they asked for more dollars ($t_{31} = 3.31$, $p < 0.01$) in fewer days ($t_{31} = -2.15$, $p < 0.04$) than afraid subjects. Additionally, as apparent from the graph for term harshness in the top half of Figure 5, these changes in bargaining behavior after the life events inventory led four afraid subjects to discover a combination of dollars and days that assured them an 85% success rate with their offers by the end of

the experiment, while no angry subjects were achieving this success rate at the end of the experiment.

Even though afraid and angry subjects experienced significantly different changes in their bargaining behavior, the significant between-subjects effects after the life events inventory could have been mostly due to prior existing differences. To resolve this issue, subjects' performance before the life events inventory on each particular measure was added as a covariate to the test of between-subjects effect for that measure. This approach partialed out differences between subjects that were not due to the emotion induction. If performance after the life events' inventory was mainly due to pre-existing differences in subjects' performance, the effect for emotion condition should have become insignificant. In all cases, the effect for emotion condition remained at least marginally significant (harshness, $t_{30} = 2.77$, $p < 0.01$; dollars offered, $t_{30} = 3.07$, $p < 0.01$; days offered, $t_{30} = -1.93$, $p < 0.06$).[1]

As apparent in Figure 5, Hypotheses 3–4 were not supported when use of threats in all the debtor contacts after the life events inventory was compared with their use in all of the debtor contacts before the life events inventory. However, careful examination of the data reveals that in Contact 5 immediately following the life events inventory, angry subjects increased their use of negative education (average use of 6.12 statements in Contact 5 vs. average use of 4.41 statements in Contact 4) while afraid subjects decreased theirs (average use of 4.88 statements in Contact 5 vs. average use of 5.25 statements in Contact 4). While the difference in the average between groups still does not attain statistical significance, the difference in how afraid and angry subjects changed their use of negative education between Contacts 4 and 5 is highly significant ($t_{31} = 3.15$, $p < 0.01$). If afraid and angry subjects' use of

negative education in Contact 5 is compared with the average over the first four contacts, the change is significant at the 0.10 level ($t_{31} = 1.72$, $p < 0.10$). Therefore, Hypotheses 3–4 receive support if tested as a change in use of threats immediately after the life events inventory.

Finally, the life events inventory produced significant differences between subjects in the types of experience recalled and significant effects for a number of the emotion measures: negative affect, pleasantness, hostility, and jitteryness. To determine whether any of these variables played a moderating or mediating role for the effects to the emotion condition, all measures of changes in bargaining performance were regressed on the significant content measures and emotion self-reports (Baron & Kenny, 1986). Then, those regressors that proved significant individual predictors of bargaining behavior were added as covariates to a regression of the change in bargaining behavior on emotion condition. Using this technique, none of the content or emotion measures was deemed to play a moderating or mediating role to emotion condition in producing changes in subjects' bargaining behavior.

DISCUSSION

During the life events inventory, afraid subjects described situations in which they felt significantly more loss of control than angry subjects, and angry subjects described situations in which they assigned significantly more blame than afraid subjects. Both groups reported significant increases in negative feelings after the life events inventory with differences in markers for fear and anger. Angry subjects significantly increased in hostility while afraid subjects stayed the same. Afraid subjects marginally increased in jitteryness while angry subjects decreased.

In bargaining after the life events inventory, angry subjects increased the

harshness of the terms they demanded asking for more dollars in fewer days. By counter, afraid subjects decreased the harshness of the terms they demanded, asking for fewer dollars in more days. Finally, immediately after the life events inventory, angry subjects significantly increased their use of threats while afraid subjects decreased theirs.

While changes in risk awareness might have explained the differences in the harshness of angry and afraid subjects' terms, such changes do not explain the changes in threat behavior. Since differences in feelings of control and identification of a wrong-doer made the same predictions as changes in risk awareness for term harshness and also predicted changes in threat behavior, changes in risk awareness do not seem to be required to explain behavior in this experiment.

Given this observation, one might wonder why the durations for the effects on terms harshness and threats were different. As noted earlier, Fredrickson and her colleagues observed that the impacts of anger and fear on cardiovascular reactivity endure for between 30 and 60 seconds (Fredrickson & Levenson, 1998; Fredrickson et al., 2000). Since, in this experiment, contacts lasted on the order of 48 seconds (12 offers at 4 seconds per offer), the time frame for the impact of anger and fear on threat behavior is in line with Fredrickson's observations as well as with general observations of the dissipation of emotions' influence on decision making over time (Schwarz & Bohner, 1996). Thus, in light of past results, the short time frame for the impact of anger and fear on threat behavior is not unusual.

It is the duration fear and anger's impacts on offer behavior that appears unusually long and in need of explanation. An examination of the top half of Figure 5 reveals that in both the cases of fear and anger, the life events inventory had an

immediate impact on decision makers' term harshness. In the case of afraid subjects, term harshness then remained depressed at a constant level through the end of the experiment while, in the case of angry subjects, term harshness continued to rise from contacts five through seven and then dipped slightly in the eighth contact.

One explanation for the pattern of results observed for afraid subjects is that by making less harsh offers, they had a higher likelihood of making offers debtors would agree to, as requested by the task instructions. Thus they were encouraged to continue with less harsh offers.

Angry subjects' pattern of behavior might also have derived from their interpretation of the task instructions. Like afraid subjects, before the life events inventory, angry subjects had very little success getting their offers accepted. After the life events inventory, angry subjects still had the same rate of success, but with harsher terms that were more advantageous to them. Since the task instructions asked angry subjects to get the best terms that debtors would agree to, their use of harsher terms that were occasionally agreed to could have seemed like an improvement, causing them to stick with harsher terms.

Limitations

Before discussing the implications of these findings, we examine their limitations. This study is limited in four ways. First, it focuses only on behavior in one confrontational bargaining task. Subjects' reactions to the emotion induction were likely conditioned by the type of task they were performing and their role in it. Two features of the task mitigate this limitation. First, confrontational bargaining tasks are widespread and occur in such areas as labor negotiations, telesales, and police interrogation, thereby suggesting wider applicability of the results. Second, by

developing one task in depth, this study was able to get to the point of measuring choice behavior that produced outcomes in an interactive environment, an area that has received little attention to date.

The fact that subjects bargained against computer algorithms and not other subjects is a second limitation. As such, the results can only be directly applied to similarly artificial circumstances. However, such circumstances are beginning to become much more common. For instance, the main attraction of one recently failed dot-com was that shoppers could haggle (bargain) with emotionally expressive software agents to attempt to obtain a better deal (Slatalla, 2000), and robot designers are beginning to incorporate emotions to make robot-human interactions more effective (Breazeal, 2000).

However, these examples also highlight a third limitation of the approach used here, the means of inducing emotion. Both examples just cited attempt to induce emotion through interface features during the interaction whereas the method used here was to stop the interaction and induce the emotion. As such, the approach used here may not fit naturally into some interactions. Nonetheless, in organizational contexts that house the type of contentious bargaining task studied here, such pauses are common as decision makers attempt to regulate the emotions they feel (Hochschild, 1983; Sutton, 1991). Work is currently underway to examine how emotions induced by interaction with emotional interfaces affect decision making in fast-paced environments. This new work is complicated by potential confounds between emotion evoked by the interaction and other information that may be presented in the interaction.

Finally, the effects hypothesized for anger and fear on decision makers' situation

representation and goals were not directly measured but inferred from prior research. A potentially profitable area for future work is to attempt to more directly measure these intermediate effects. However, as just observed in summarizing the results reported here, such measures may mitigate emotion's impact by allowing time to pass between the emotion induction and the decision, causing emotion to subside and thereby attenuate its influence (Schwarz & Bohner, 1996).

Implications

Emotion may be an element in any decision, not just when decision makers or those designing systems choose to evoke it. The approach used here focused on stimulating different individual emotions to demonstrate that these emotions have unique and predictable effects on repeated decisions that are at least partially under the control of the information system designer.

As such, the theoretical framework and results presented here have important implications for designing fast-paced electronic decision environments. An important issue in decision support has been how to motivate decision makers to change their behavior. Two of the most important levers, making certain decision strategies easier (Jarvenpaa, 1989; Todd & Benbasat, 1991, 1999, 2000) and enhancing outcome feedback (Davis & Kottemann, 1995; Gibson, 2000; Sengupta and Abdel-Hamid, 1993) may be difficult to implement in fast-paced environments. Both imply that designers have an understanding of the decision environment's underlying structure, what an implied good decision is within that structure, and an understanding of how to communicate this information to the decision maker.

In rapidly changing environments where decision makers must react to a variety of different situations, structural knowledge about the environment and what makes a

good decision in it may both be difficult to obtain. Even if such knowledge or suitable facsimile is available, it may be difficult to construct the information system to take advantage of it. For instance, when making sales pitches over the phone or on-line, one has to quickly collect and take advantage of ad-hoc facts to make the sale. While an information system may be able to provide guidance to collect these facts and the categories of facts to focus on, it is far more difficult for the system to provide guidance on how to use specific facts.

It is in precisely this kind of situation, where providing specific guidance is difficult, that the approach described here best applies. Inducing emotion causes decision makers to represent the environmental context in certain ways and to favor particular styles of action, e.g., feeling more certain, in control, and likely to identify a wrong-doer or less certain, less in control, and less likely to identify a wrong-doer. A critique of using emotion to guide decision behavior is that its effects tend to always be this broad and imprecise (LeDoux, 1996). However, broad guidance may, in fact, be quite desirable when the organization wants to promote broad decision strategies, but the decision task is so complex that the final choice must be left to the individual decision maker.

Why not just provide decision makers with broad guidelines? As illustrated in the results reported here (i.e., when afraid decision makers did not become more lenient in their terms until after the emotion induction even though they had been instructed to compromise in case of non-agreement) and time and again in the broader decision support literature (e.g., Davis & Kottemann, 1995; Sengupta and Abdel-Hamid, 1993), guidelines by themselves do not seem to change behavior.

These results also have implications for decision making. Unlike much of the

work on emotion in decision making which focuses on single judgments or gambles without feedback (e.g., Raghunathan & Pham, 1999; Schwarz, 1990), these results relate to decision makers making repeated decisions with outcome feedback. In both the cases of angry and afraid subjects, the emotions manipulation, and not outcome feedback from the first four contacts, provided the initial impetus for changed behavior that lasted until the end of the experiment. As has been observed in many repeated decision tasks (e.g., Davis & Kottemann, 1995; Sterman, 1989), decision makers' decisions in the first half of this experiment appeared insensitive to ordinary outcome feedback, perhaps because, as just noted, its interpretation was ambiguous. The extent to which and circumstances under which emotion interacts with outcome feedback to guide decision makers is undergoing further investigation.

Conclusion

Emotion is an effective design element in information systems for getting decision makers to change their behavior. The work presented here suggests that emotions may be as potent as non-emotional decision aids such as facilitating particular decision strategies or enhancing outcome feedback. However, emotion's influence on decision making remains an active area of research, and its incorporation into information systems is only very recent. Fruitful areas for future research include examining the effects of different ways emotion may be incorporated into information systems such as through interactive facial or verbal expressions. Work in both these areas is currently ongoing.

REFERENCES

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 63, 320–330.

Bechara, A., Tranel, H., & Damasio, A. R. (1997). Deciding advantageously before knowing the advantageous strategy. Science(275), 1293–1295.

Blanchard, R. J., & Blanchard, D. C. (1989). Attack and defense in rodents as ethoexperimental models for the study of emotion. Progress in Neuro-Psychopharmacology & Biological Psychiatry, 13(Suppl).

Breazeal, C. (2000). Sociable machines: Expressive social exchange between humans and robots. Unpublished doctoral dissertation, Massachusetts Institute of Technology.

Davis, F. D., & Kottemann, J. E. (1995). Determinants of decision rule use in a production planning task. Organizational Behavior and Human Decision Processes, 64(2), 145–157.

Fleiss, J. L. (1981). Statistical methods for rates and proportions. New York: John Wiley & Sons.

Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. Cognition and Emotion, 12(2), 191–220.

Fredrickson, B. L., Maynard, K. E., Helms, M. J., Haney, T. L., Siegler, I. E., &

Barefoot, J. C. (2000). Hostility predicts magnitude and duration of blood pressure response to anger. Journal of Behavioral Medicine, 23(3), 229-243.

Gibson, F. P. (2000). Feedback delays: How can decision makers learn not to buy a new car every time the garage is empty? Organizational Behavior and Human Decision Processes, 83(1), 141–166.

Gibson, F. P., Fichman, M., & Plaut, D. C. (1996). Learning in dynamic decision tasks—Credit collections at Citicorp (Tech. Rep.). Citicorp Behavioral Sciences Research Council.

Goldberg, J. H., Lerner, J. S., & Tetlock, P. E. (1999). Rage and reason: The pscyhology of the intuitive prosecutor. European Journal of Social Psychology, 29(5–6), 781–795.

Hafner, K. (2001). Game simulations for the military try to make an ally of emotion. The New York Times.

Hertel, G. (1999). Mood effects in social dilemmas: What we know so far. In M. Foddy, M. Smithson, S. Schneider, & M. Hogg (Eds.), Resolving social dilemmas: Dynamics, structural, and intergroup aspects (p. 227-243). Ann Arbor, MI: Edwards Brothers.

Hertel, G., Neuhof, J., Theuer, T., & Kerr, N. L. (in press). Mood effects on cooperation in small groups: Does positive mood simply lead to more cooperation? Cognition & Emotion.

Hochschild, A. R. (1983). The managed heart: Commercialization of human feeling. Berkeley, CA: University of California Press.

Izard, C. E. (1993). Four systems for emotion activation: Cognitive and noncognitive processes. Psychological Review, 100(1), 68–90.

Jarvenpaa, S. L. (1989). The effect of task demands and graphical format on information processing strategies. ManagementScience, 35(3), 285–303.

Judd, C. M., & McClelland, G. H. (1989). Data analysis: A model comparison approach. San Diego, CA: Harcourt Brace Jovanovich.

Keltner, D., Ellsworth, P. C., & Edwards, K. (1993). Beyond simple pessimism: Effects of sadness and anger on social perception. Journal of Personality & Social Psychology, 64(5), 740–752.

Krippendorf, K. (1980). Content analysis: An introduction to its methodology. Newbury Park: Sage Publications.

Lang, P. J. (1995). The emotion probe: Studies of motivation and attention. American Psychologist, 50(5), 372–385.

LeDoux, J. (1996). The emotional brain. New York: Simon & Schuster.

Lemerise, E. A., & Dodge, K. A. (1993). The development of anger and hostile interactions. In M. Lewis & J. M. Haviland (Eds.), Handbook of emotions (pp. 537–546). Guilford Press.

Lerch, F. J., & Harter, D. E. (2001). Cognitive support for real-time dynamic decision making. Information Systems Research, 12(1), 63–82.

Lerner, J. S., Goldberg, J. H., & Tetlock, P. E. (1998). Sober second thought: The effects of accountability, anger, and authoritarianism on attributions of responsibility. Personality and Social Psychology Bulleting, 24(6), 563–574.

Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgment and choice. Cognition & Emotion, 14(4), 473–493.

Loewenstein, G. (1996). Out of control: Visceral influences on behavior. Organizational Behavior and Human Decision Processes(65), 272–292.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. Psychological Bulleting, 127(2), 267–286.

Luce, M. F., Bettman, J. R., & Payne, J. W. (1997). Choice processing in emotionally difficult decisions. Journal of Experimental Psychology: Learning, Memory, and Cognition, 23(2), 384–405.

Mellers, B., Schwartz, A., & Ritov, I. (1999). Emotion-based choice. Journal of Experimental Psychology: General, 128(3), 332–345.

Mellers, B. A., Schwartz, A. H., & Ritov, I. K. (1997). Decision affect theory: Emotional reactions to the outcomes of risky options. Psychological Science, 8(6), 423–429.

Pillutla, M. M., & Murnighan, J. K. (1996). Unfairness, anger, and spite: Emotional rejections of ultimatum offers. Organizational Behavior and Human Decision Processes, 68(3), 208–224.

Plutchik, R. (1993). Emotions and their vicissitudes: Emotions and psychopathology. In M. Lewis & J. M. Haviland (Eds.), Handbook of emotions (pp. 53–66). The Guilford Press.

Rafaeli, A. (1989). When clerks meet customers: A test of variables related to emotional expressions on the job. Journal of Applied Psychology, 74(3), 385–393.

Rafaeli, A., & Sutton, R. I. (1987). Expression of emotion as part of the work role. Academy of Management Review, 12, 23-37.

Rafaeli, A., & Sutton, R. I. (1991). Emotional contrast strategies as means of social influence: Lessons from criminal interrogators and bill collectors. Academy of Management Journal, 34(4), 749–775.

Raghunathan, R., & Pham, M. T. (1999). All negative moods are not equal: Motivational influences of anxiety and sadness on decision making. Organizational Behavior and Human Decision Processes, 79(1), 56–77.

Russell, J. A., Weiss, A., & Mendelsohn, G. A. (1989). Affect grid: A single-item scale of pleasure and arousal. Journal of Personality and Social Psychology, 57(3), 493–502.

Schachter, S., & Singer, J. E. (1962). Cognitive, social, and physiological determinants of emotional state. Psychological Review, 69(5), 379–399.

Scherer, K. R. (1988). Criteria for emotion-antecedent appraisal: A review. In V. Hamilton (Ed.), Cognitive perspectives on emotion and motivation (pp. 89–126). Kluwer Academic Publishers.

Schwarz, N. (1990). Feelings as information: Informational and motivational functions of affective states. In Handbook of motivation and cognition: Foundations of social behavior (Vol. 2, pp. 527–561). New York: Guilford Press.

Schwarz, N., & Bohner, G. (1996). Feelings and their motivational implications: Moods and the action sequence. In The psychology of action: Linking cognition and motivation to behavior. New York: Guilford Press.

Schwarz, N., & Clore, G. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. Journal of Personality and Social Psychology, 45, 513–523.

Sengupta, K., & Abdel-Hamid, T. K. (1993). Alternative conceptions of feedback in dynamic decision environments: An experimental investigation. Management Science, 39(4), 411–428.

Slatalla, M. (2000). Haggling on the web, interface to interface. The New York Times.

Smith, C. A., & Ellsworth, P. C. (1985). The patterns of cognitive appraisal in emotion. Personality & Social Psychology, 48(4), 813–838.

Sterman, J. D. (1989). Misperceptions of feedback in dynamic decision making. Organizational Behavior and Human Decision Processes, 43, 301–335.

Sutton, R. I. (1991). Maintaining norms about expressed emotions: The case of bill collectors. Administrative Science Quarterly, 36, 245–268.

Todd, P., & Benbasat, I. (1991). An experimental investigation of the impact of computer based decision aids on decision making strategies. Information Systems Research, 2(2), 87–115.

Todd, P., & Benbasat, I. (1999). Evaluating the impact of dss, cognitive effort, and incentives on strategy selection. Information Systems Research, 10(4), 356–374.

Todd, P., & Benbasat, I. (2000). Inducing compensatory information processing through decision aids that facilitate effort reduction: An experimental assessment. Journal of Behavioral Decision Making, 13, 91–106.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The panas scales. Journal of Personality and Social Psychology, 54(6), 1063–1070.

APPENDIX A: MOOD INDUCTION TASK

The following text was used in the mood induction task. Subjects were asked to describe situations that either made them enraged or (very afraid) as described above.

I'm Mike Hoexter. As part of my research, I am developing a life-events inventory. To sample what happens to people we ask many participants to report on just one event in some detail. Help us with that by telling us about an event in your life that made you feel enraged (very afraid).

1. Please take a minute to re live this event in your mind's eye. What happened? What was it that made you feel enraged (very afraid)? (approx. 100 words)
2. What is the most vivid image that comes to mind when you think of that event? (approx. 100 words)
3. What thoughts went through your mind as the event unfolded? How did you feel while this was going on? (approx. 100 words)
4. Can you remember your bodily reactions? What were they? (approx. 100 words)
5. Please take a moment to briefly summarize what happened to make you feel enraged (very afraid), the images that came to mind, the thoughts and how they made you feel and your bodily reactions. (approx. 100 words)

FOOTNOTES

[1]The effect for the covariate alone was also always highly significant, but this is expected due to serial correlation in the repeated measures on the same subject (harshness, $t_{30} = 9.28$, $p < 0.001$; dollars offered, $t_{30} = 9.59$, $p < 0.001$; days offered, $t_{30} = 7.41$, $p < 0.001$).

FIGURE CAPTIONS

Figure 1. Interface used for Collections task.

Figure 2. Codes for Content Analysis of Question 1 in the Life Events Inventory

Figure 3. Average number of statements coded as AB and LC in Question 1 of the life events inventory.

Figure 4. Subjects' emotion measures.

Figure 5. Subjects' bargaining performance.

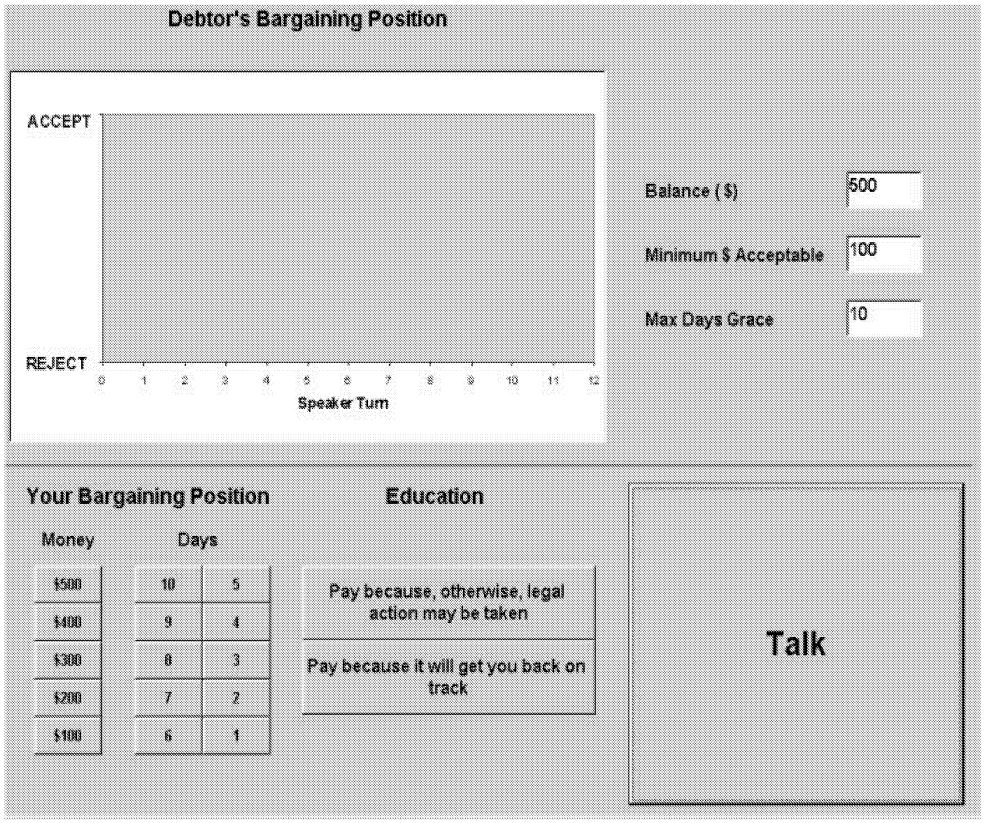


Figure 1: Interface used for Collections task.

Code	Name	Definition
LC	Loss of Control	· Statement that something bad is about to happen that is not in the writer's control and is not blamed explicitly on someone else. · Expression of being ignored or isolated. · Expression of worry.
AB	Assigning Blame	· Saying that someone did something they should not have done. · Saying that a bad outcome was the result of someone's actions.
O	Other	· Anything else.

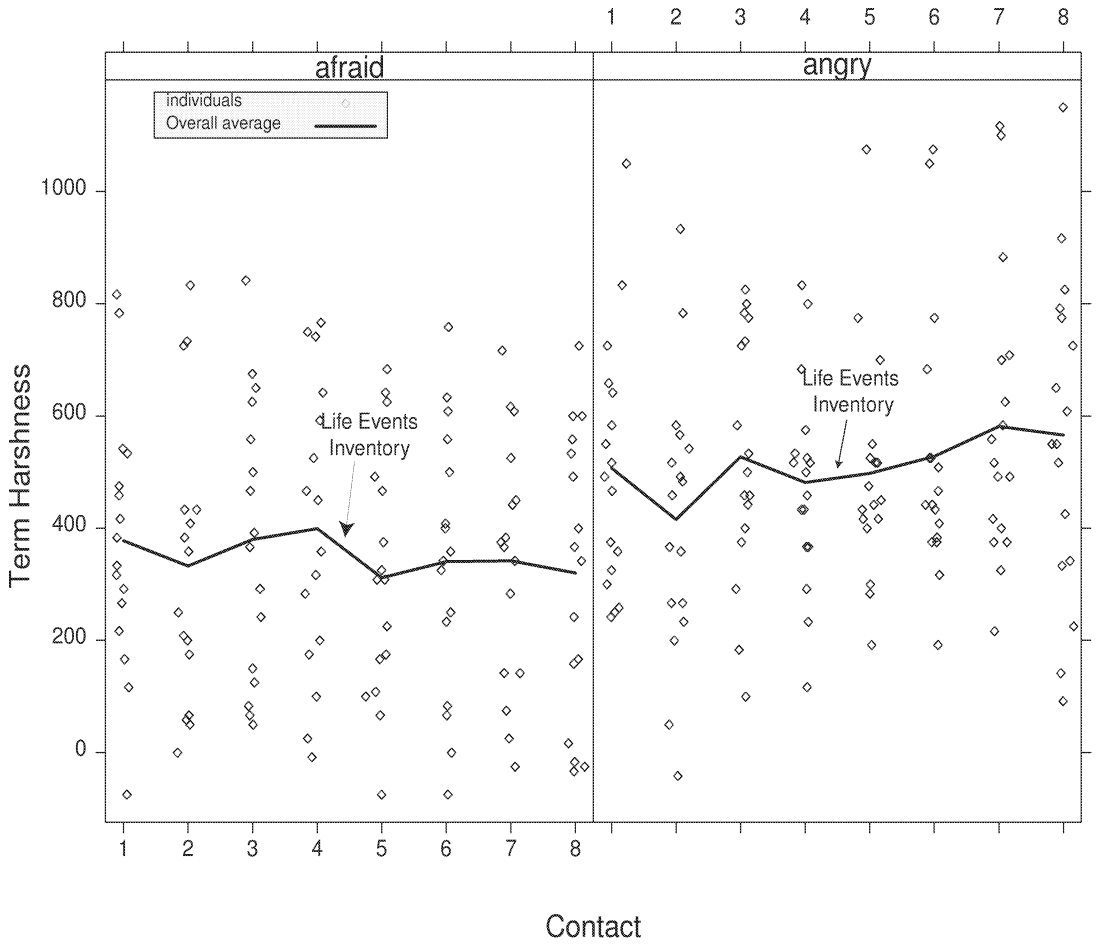
Figure 2: Codes for Content Analysis of Question 1 in the Life Events Inventory

	Code		Between	
Condition	LC	AB	LC	AB
afraid	8.41	0.44	**	**
angry	1.59	3.82		
mean	4.89	2.18		

Figure 3: Average number of statements coded as AB and LC in Question 1 of the life events inventory. The between columns indicate that the differences between afraid and angry subjects are significant at $p < 0.01$.

		Self-Rating			Main Effects		
Measure	Condition	Before	After	Mean	Between	Within	Interaction
Pleasantness	afraid	4.63	4.50	4.57	*ns*	+	*ns*
	angry	5.53	3.88	4.71			
	mean	5.08	4.19	4.64			
Negative Affect	afraid	7.78	8.81	8.30	*ns*	$*$	*ns*
	angry	7.74	9.11	8.42			
	mean	7.76	8.96	8.36			
Components of Negative Affect Related to Fear and Anger							
Hostile	afraid	1.63	1.69	1.66	*ns*	$**$	$*$
	angry	1.35	2.35	1.85			
	mean	1.49	2.02	1.76			
Jittery	afraid	1.75	2.00	1.88	*ns*	*ns*	+
	angry	1.94	1.59	1.77			
	mean	1.85	1.80	1.83			
Afraid	afraid	1.31	1.44	1.38	*ns*	*ns*	*ns*
	angry	1.35	1.18	1.27			
	mean	1.33	1.31	1.33			
Scared	afraid	1.31	1.38	1.35	*ns*	*ns*	*ns*
	angry	1.12	1.24	1.18			
	mean	1.22	1.31	1.27			

Figure 4: Subjects' self-ratings before and after the life events inventory. In the columns Between, Within, and Interaction, + indicates two-tailed significance at $p < 10$; $*$ at $p < 0.05$; and $**$ at $p < 0.01$.



(a) Performance across all eight contacts in the experiment by condition.

Measure	Condition	Contact Group 1–4	Contact Group 5–8	Mean	Main Effects Between	Main Effects Within	Interaction
Harshness	afraid	372.27	328.65	350.46	**	*ns*	*
	angry	482.84	543.26	513.06			
	mean	427.56	435.96	431.76			
Dollars	afraid	306.64	288.42	297.53	**	*ns*	**
	angry	354.53	375.98	365.26			
	mean	330.59	332.20	331.40			
Days	afraid	7.34	7.60	7.47	**	*ns*	+
	angry	6.72	6.33	6.53			
	mean	7.03	6.97	7.00			
Threats per contact	afraid	5.28	5.31	5.30	*ns*	*ns*	*ns*
	angry	5.32	5.41	5.37			
	mean	5.30	5.36	5.33			

(b) Bargaining performance by contact group. + indicates two-tailed significance at $p < 10$; $*$ at $p < 0.05$; and $**$ at $p < 0.01$.

Figure 5: Subjects' bargaining performance.