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Effects of Moral Concerns on Negotiations

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Abstract

There is now considerable evidence that emotion plays an important role in negotiation. Emotions, such as anger and happiness, affect concession-making, not only in human vs. human negotiations but also in human vs. agent negotiations. Recent research has demonstrated the impact of emotional expressions in morally-charged negotiations. Thus, taking people's moral concerns into account is crucial for building agents that operate in morally sensitive domains. This paper explores the interplay between people's moral concerns, emotional expressions and concession-making during a morally charged negotiation. Our results demonstrate that participants who had stronger concerns for the Individualizing foundations (Harm and Fairness) make greater concessions for sacred negotiation items when faced with a sad opponent than an angry opponent. Also, we find that participants who had high Binding foundations (In-group, Authority and Purity) are more sensitive to social status, and make greater concessions in scenarios that involve agents in a higher social status.

Keywords: Emotion; Moral Foundations Theory; Sacred values; Negotiation; Agent Modeling.

Introduction

With the growing interest in understanding the role of emotional expressions in negotiation (e.g., Barry, Fulmer & Goates, 2006; Van Kleef et al., 2010), many studies have investigated how emotional expression affects negotiation processes and outcomes (Ames & Johar, 2009; Choi et al., 2012; de Melo et al., 2014). For instance, negotiators concede more when their opponent expresses anger instead of happiness (Van Kleef, De Dreu & Manstead, 2004a, 2004b). Sinaceur & Tiedens (2006) further reveal that the effect of anger on concession works only when anger recipients have poor alternatives. The past works on emotional expression suggest that emotion plays an important role as a signal (e.g., anger indicates a negotiator's dissatisfaction with his opponent's offer). Furthermore, negotiators respond to emotional expressions depending on their own conditions (e.g., alternatives). Thus, it is important to understand what moderates a negotiator's reaction to emotional expression.

Past studies have shown that positive moods in negotiation foster concession-making (e.g., Carnevale & Isen, 1986). Mood effects may be mediated by expression of positive emotion, for example, a positive-mood induction procedure may lead negotiators to smile more and this smiling may have an impact on perceptions and concession-

making. Regardless, the possible interaction of emotion and other variables, for example, cognition as in decision frame (Carnevale, 2008), or motivation as in moral concerns, is a domain highly worthy of inquiry.

Although some studies have tried to understand how people's innate personality interacts with their emotion during negotiation games (Bolton, Katok, & Zwick, 1998; Batson & Moran, 1999), little research has paid attention to how moral concerns impact reactions to emotional expressions and affect concession-making. Our recent research demonstrates that emotional expressions can potentially shift moral concerns during a negotiation, such that displays of anger would backfire if the negotiator associates moral significance to the objects of the negotiation, whereas displays of sadness promote higher concession-making (Dehghani, Gratch and Carnevale, 2012). Because morality significantly influences decision-making (e.g., Sjöberg & Winroth, 1986; Gintis et al., 2003), the present research aims to examine the role of people's moral concerns on how they react to emotional expressions and make concessions.

Adapting the Moral Foundations Theory (Haidt & Graham, 2007; Haidt & Joseph, 2007; Graham, 2013), we examine effects of two different types of foundations (i.e., Individualizing foundations and Binding foundations) on concession-making. We predict that people who have stronger Individualizing foundations would react more to emotional expressions because the Individualizing foundations indicate the tendency to care about other people's emotions (whether others are emotionally or physically suffering, or being treated fairly) and therefore, that would effect their concession-making. On the other hand, we predict that people with stronger Binding foundations be more sensitive to their negotiation partner's social status because Binding foundations indicate concern about other people's roles in the group (whether negotiation partner is their boss or co-worker).

Understanding the interaction between moral concerns and emotion are crucial in designing autonomous decision-making agents that operate in morally sensitive domains. Progress in agent research has enabled us to work closely with software agents in morally sensitive situations where agents' actions may lead to significant results, such as loss of life (Tambe, 2011; Dehghani et al., 2013). Therefore, it is important to better understand the interactions between people's moral concerns, emotion and agent decision-making strategies. Our results suggest that incorporating

understanding of people's moral concerns and their reactions to emotional expressions are crucial in designing such agents.

The paper is structured as follows: First, we discuss the Moral Foundations Theory. Next, we introduce the framework we used in our experiment. Then, we describe our experimental design and hypotheses. Finally, we explain our results and future work.

Moral Foundations Theory

In Moral Foundations Theory (Haidt & Graham, 2007; Haidt & Joseph, 2007; Graham, 2013), Graham, Haidt and Nosek (2009) introduce two different types of foundations: Individualizing foundations and Binding foundations. They refer to the Harm/Care and Fairness/Reciprocity foundations as ''Individualizing'' foundations because of the focus on individual rights, and they refer to the In-group/Loyalty, Authority/Subversion, and Purity/Sanctity foundations as ''Binding'' foundations because of the focus on binding individuals within groups through duties and loyalty. Five moral sensitivities in both types of foundations are:

- Harm/Care: A concern for caring for and protecting individuals from harm.
- Fairness/Reciprocity: A concern for justice, rights and autonomy.
- In-group/Loyalty: A concern with issues of loyalty and self-sacrifice for ones in-group.
- Authority/Subversion: A concern with issues associated with showing respect and obedience to authority.
- Purity/Sanctity: A concern for purity and sanctity.

The Moral Foundations Theory argues that each of these five foundations serve distinct but related social functions and the degree of emphasis on these foundations varies across cultures. This theory has been used to investigate political cultures (e.g., liberals and conservatives) and judgments about cultural issues (e.g., abortion, immigration, and same-sex marriage) (Koleva et al., 2012). Specifically, Graham, Haidt and Nosek (2009) demonstrate that liberals place more significance on the Harm/Care and Fairness/Reciprocity foundations relative to the other three foundations, whereas conservatives place a relatively equally focus on all five foundations.

We hypothesize that Individual foundations would interact with the agent's expressed emotion and Binding foundations would interact with the social status of the opponent. This is because we expect Individualizing foundations are closely related to an individual's emotional status, whereas Binding principles are more related to people's roles in the group. To measure the degree to which people value each of five foundations, we used the 32-item Moral Foundations Questionnaire (MFQ) (Graham et al., 2011).

Sacred-Objects Negotiation Task

Dehghani, Gratch and Carnevale (2012) introduced the Sacred-Objects Negotiation Task, a web-based multi-round negotiation task where a participant and a computer-agent can make a proposal in turn to negotiate items (Figure 1).

Four different items are placed on a trading board initially, and participants can move items on the board into own possession or into opponent's possession by dragging and dropping the items. After each round, the player who received the proposal can choose either to accept the proposal or make a new proposal. Both the agent and the participant can express their emotional reaction using facial display during the game.

There are six rounds of negotiation during which each player makes six proposals in total.
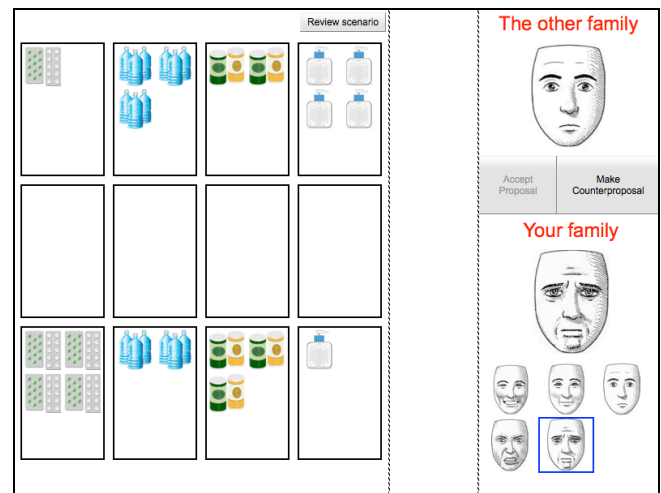

Figure 1: Sacred-Objects Negotiation Task Interface.

Agent Expressions

Agents follow one of two possible facial display policies depending on the condition: anger or sadness. Regardless of a participant's offer, the angry agent always displays anger on rounds 1, 3, and 5, and returning to a neutral face after five seconds. The sad agent acts in the same way but displays sadness instead of anger. In all other rounds, both agents display a neutral face (Figure 2).
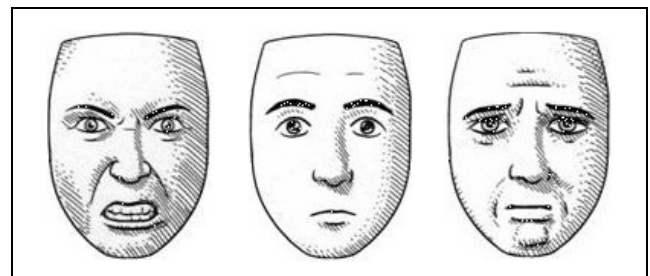

Figure 2: Facial displays used in the experiment
(Anger, Neutrality and Sadness)

Agent Offers

All agents in this study follow one of the following two strategies. In the first strategy, the agent starts with making no concessions at all (non-conceder agent) and concedes little through the negotiation. In the second strategy, the agent starts with some concession (conceder) and gradually increases its concession. Both strategies involve more and more concession over time.

There are four different groups of items in the negotiations ([medicine packages, water bottles, food cans, hand sanitizers]), with five items per group. The negotiation strategy of the non-conceder agent is as follows: Round 1: [0, 0, 0, 0]; Round 2: [0, 1, 2, 2]; Round 3: [1, 0, 1, 2]; Round 4: [1, 1, 3, 2]; Round 5: [1, 2, 4, 4]; Round 6: [2, 1, 2, 2], where the numbers in the brackets represent how many times in each group the agent chooses to give to the participant. The negotiation strategy of the conceder agent is as follows: Round 1: [2, 1, 1, 1]; Round 2: [2, 1, 2, 2]; Round 3: [2, 2, 2, 3]; Round 4: [3, 1, 1, 1]; Round 5: [3, 2, 1, 2]; Round 6: [3, 3, 2, 2].

To decide whether to accept or reject a participant's offer, the agent uses hidden payoff values for each group of items; the value of medicine package, a water bottle, a food can, and a hand sanitizer are estimated as 50, 10, 5, and 1 respectively. The agent accepts the offer only when the received offer has greater or equal values to the one the agent is about to make. Otherwise, it rejects the offer and proposes a new offer.

Experiment

In the following experiment, we investigate the interplay of moral concerns and the interpersonal effects of emotion in the Sacred-Objects Negotiation Task described above.

As discussed previously, our first hypothesis is that strong preference on Individual foundations (Harm and Fairness) would yield larger concessions to sad compared to angry agent on items that are of moral importance to participants.

Secondly, we hypothesize Binding foundations (In-group, Authority and Purity) interacts with opponent's social status (boss vs. co-worker). We suggest that people with high Binding foundations concede more to their boss than their co-worker, while people with low Binding foundations behave reversely.

Participants

153 American Amazon-Turk workers (age: 35.1, gender: 54.4% female) were paid $1 each to participate in our study. We set the following qualification requirement in the Amazon-Turk; to avoid novice Amazon-Turk workers, we limited participants to ones having greater than or equal to 100 approved HIT. To avoid excessively professional survey-takers, we also limited participants to ones having less than 10,000 HIT. On average it took each participant 15 minutes and 21 seconds to complete our task.

Design

The experiment follows a 2 X 2 X 2 between-subject factorial design with the following independent variables: *Agent's expressed emotion* (anger vs. sadness), *Experimental scenario* (boss vs. co-worker), and *Moral concern cluster* (high Individualizing foundations vs. low Individualizing foundations). The main dependent variable in our experiment is demand difference of medicine, which is calculated by subtracting demand of medicine in round one from demand of medicine in the last round of negotiation. Higher demand difference of medicine indicates higher concession on medicine in the last round of negotiation compared to the first round. The maximum demand difference is five, and the minimum demand difference is zero in our setting.

There has been an earthquake in the town you live in and many have been injured. All roads to your town have been blocked and as a result aid is coming in very slowly. Because of this every family has to split packages of aid sent using helicopters with your [A: boss] [B: co-worker]'s family.

You and the family that have to split the aids with each other, both have babies who have been injured and have developed infections. The only way to control the spread of infection, which if not stopped will become lethal, is to use penicillin. You are also running low on food, but have enough clean water that would last you for several days. You have enough soaps, so you might not need any hand sanitizers. Given the circumstances, you know that no other aid package will be received for another week.

In the task, to review, you will negotiate with the other family over the aid packages that include

1. Medicine (penicillin)
2. Water bottles
3. Canned food
4. Hand sanitizer

You have to negotiate how these items have to be split between your family and your [A: boss] [B: co-worker]'s family. You do not know how much food and water the other family has.

The negotiation is done in a sequence of alternating offers. You will make the first offer. The other negotiator may or may not accept your offer. If it does not accept it, that is, if it rejects your offer, it will send you a new offer. You can either accept or reject its offer. If you accept it, you will get to keep the items that you did not give them. If you reject their offer, you can make another offer and submit it to them. Both families will have a chance to make 6 offers in this negotiation.

Figure 3: Participants were presented either scenario A (boss) or scenario B (co-worker)

Procedure

After agreeing on the consent form, each participant was first given the 32-item MFQ. In the MFQ, we inserted two questions with clear correct answer to ensure that the participants were filling out the questionnaire in good faith. Participants who missed the filter question were not allowed to participate in the experiment. Participants then received one of the two scenarios described in Figure 3. We differentiate the hierarchy of the opponent in two levels, boss and co-worker.

After reading one of the scenarios, participants were asked to take a quiz, which was designed to check their understanding of the experimental scenario. There were five questions (e.g., Which item in your possession is running low?; What is the only way to control the spread of infection in your baby?). If they missed any of the questions, they were asked to read the scenario again until they gave correct answers to all five questions in the quiz. This was to ensure that all participants completely understood the experimental scenario and would provide reliable data.

We then assessed participants' values regarding the medicine package using Baron and Spranca's (1997) measure of sacred value. In line with this measure, we asked participants "How do you feel about giving up the medicine package?" and they received the following four choices:

a. I think this definitely needs to happen.
b. I do not object to this.
c. This is acceptable only if the benefits of trading the medicine are great enough.
d. This should not be done no matter how great the benefits.

We categorized participants who selected "d" as having a sacred value for the medicine package. Participants then played the Sacred-Objects Negotiation Task with one of the agents described above (conceder vs. non-conceder, sad vs. angry). Participants were not told they would play with artificial agents. To simulate that the participants were playing other humans, we added randomized delays in response time (3~8 sec). During the game-play, participants could review the scenario anytime by pressing the "review scenario" button on the top of the interface.

After completing the Sacred-Objects Negotiation Task, we asked participants to fill out a short demographic questionnaire.

Results and Analysis

Participants who dropped out of the negotiation before Round 3 were excluded from the analysis (N = 20) because they made only one or two offers and were exposed to the emotional displays of the agent only once. There was no effect of strategy, so we collapsed across agent strategy conditions. Among a total of 133 participants, 96 participants (72.2%) regarded the medicine package as a sacred item, hence we compared participants who perceived medicine as sacred items compared to those who did not.

Extending the previous research, we hypothesized that an agent's anger and sadness expression would interact with a negotiator's moral concerns. We clustered participants based on their concerns on Individualizing (Harm and Fairness) and Binding (In-group, Authority and Purity) foundations (measured using the MFQ).

Individualizing Foundations

Individualizing foundations (Harm and Fairness) concentrate on the *individual* as the locus of moral value (Haidt & Graham, 2007). We hypothesized there would be behavioral differences in how participants with high or low Individualizing foundations negotiate in a moral domain. We added participants' scores on the Individualizing foundations, and performed a median split on our data using these scores. We named the people who had high Harm and Fairness values as highHF and low Harm and Fairness value as lowHF.

The data was analyzed using a two way ANOVA with three between-subject factors, *the agent's expressed emotion* (anger vs. sadness), *participants' perception to the medicine package* (sacred value vs. no sacred value) and *moral foundation cluster* (high HF vs. low HF). There was a significant interaction between agent emotion and sacred value ($F(1,83) = 4.248$, $p = 0.04$). This is a replication of
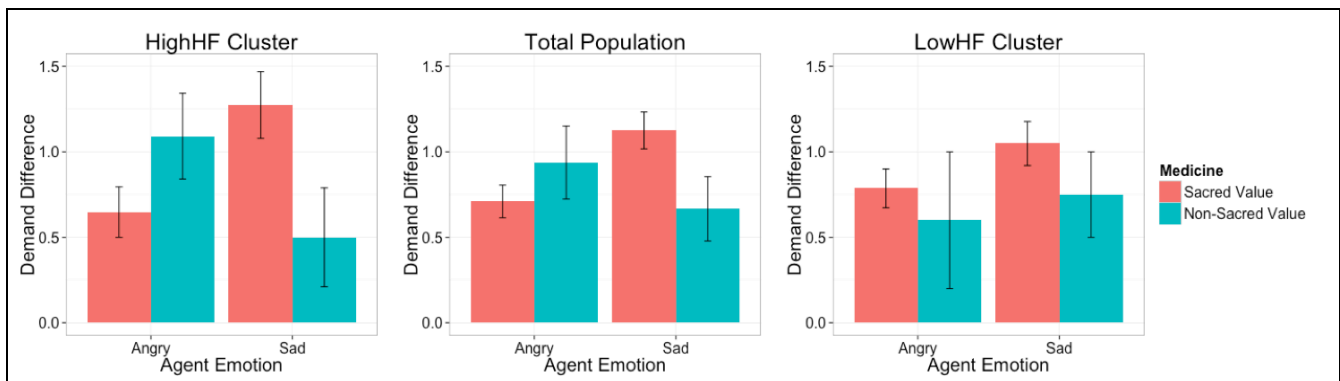

Figure 4: Demand difference for medicine in highHF cluster (left), in total population (center), in lowHF cluster (right)

Dehghani, Gratch and Carnevale (2012) where they demonstrate that people conceded more to a sad agent than an angry agent when they perceived a negotiation item as sacred, but act in an opposite way when perceiving an item as non-sacred one (Figure 4, center). There was also a marginal three-way interaction between agent emotion, sacred values and HF cluster ($F(1,83) = 3.189$, $p = 0.07$). To further investigate this three-way interaction, we analyzed the data separately for the two HF clusters (highHF vs. lowHF). In the highHF cluster, ANOVA results indicate a significant interaction between emotion and sacred values ($F(1,39) = 6.545$, $p = 0.01$). Following up, T-tests show that highHF participants conceded more on morally significant items to sad agents compared to angry agents ($t(26) = 2.598$, $p = 0.01$). However, the interaction between emotion and sacred values is insignificant in lowHF cluster ($F(1,44) = 0.077$, $p = 0.78$).

We also analyzed participants' frequency of expressed emotions. Our results show that participants who have higher Individualizing concerns expressed emotions more frequently than those who have low Individualizing concerns ($t(131) = 2.003$, $p = 0.04$).

Binding Foundations

Binding foundations (In-group, Authority and Purity) concentrate on the *group* as the locus of moral value (Haidt & Graham, 2007). We did the same clustering for Binding foundations. We added participants' In-group, Authority and Purity values and divided all the participants in two groups using the median. We referred to participants who had high Binding foundation values as highIAP and low Binding foundations as lowIAP.
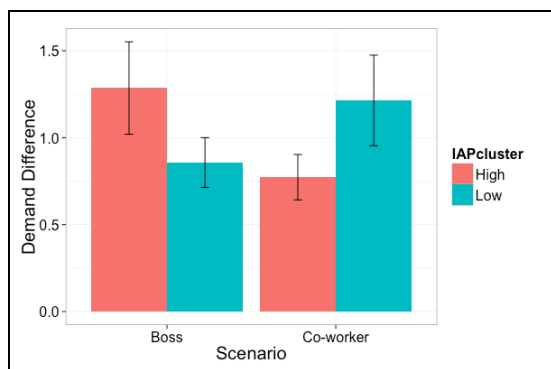

Figure 5: Demand difference for medicine when perceived as sacred item in high/low IAP cluster

As our two scenarios included two different levels of hierarchy of the opponent (boss vs. co-worker), we expected that participant's level of Binding concerns would affect their concession rate. We performed a 2 X 2 ANOVA, where the first factor was the scenario (boss vs. co-worker) and the second factor was IAP cluster. As expected, there was a significant interaction between the scenario and the IAP cluster for demand difference of medicine ($F(1,67) = 5.162$, $p = 0.02$) (Figure 5).

Discussion

In this experiment, we demonstrated that emotions in morally charged negotiations interact with moral concerns. Specifically, the moral concerns a person considers most important are directly correlated with their behavior in negotiations. The main findings include that Individualizing foundations (Harm and Fairness) interact with reactions to emotions, while Binding foundations (In-group, Authority and Purity) interact with opponent's social status rather than reactions to emotions.

People with high Individualizing foundations show greater concessions to sad compared to angry agents on items that they associate a moral significance to, while they show greater concessions to angry compared to sad agents on items which they do not consider as morally significant. In other words, for people who value Harm and Fairness strongly, when sacred value items are at stake in a negotiation, anger produces a counterproductive effect; that is, concessions on morally significant items become larger in the case of seeing the other player's sad face and feeling that the other player is weak. The nature of Individualizing foundations can explain this interplay of emotions and morality: this is due to valuing fairness and well-being of *individuals* over other factors. The assumption made is that the sad player has suffered some sort of injustice, or that the sad player needs to be taken care of. Thus, people with high Individualizing foundations make more concession on morally significant items to sad agents in negotiations.

Another finding of this paper is that high Binding foundations are correlated with the opponent's social status rather than opponent's emotional expressions. People with higher Binding foundations concede more to an opponent with high social status than one with low social status. This is because people with high Binding concerns tend to care more about people's roles in the *group*, rather than an *individual's* emotional status. Thus, a player with high group standing will be more respected, feared, or admired and a person with high Bindings concerns will concede more to that player. This tendency is reversed in people with lower Binding foundations, who care less about the authority of the other side. They rather feel empathy for their co-workers, so they make more concessions to their co-workers.

These findings are important to understand what affects a negotiator's reaction to emotional expression, hence they should be considered while designing autonomous agents that are to operate in morally sensitive negotiations. Considering that decision-making in morally sensitive missions (e.g., military operations) often results in life or death outcomes for humans (Dehghani et al., 2013), accurate prediction of people's concession-making would be an important factor. For example, if a robot is trying to save people from a disaster, based on that culture's moral concerns, it might be more effective for it to express sadness to persuade them to leave their morally significant possessions and escape from the dangerous area. Even though not all moral concerns might apply in practice as we

used a hypothetical scenario in our experiment, these findings certainly suggest future direction of building agents that operate in morally sensitive domains.

As a future work, we plan to conduct the same experiment in an East Asian country to see if there are greater effects of social status in a relatively hierarchical culture. Brett & Okumura (1998) show the social status difference interacts with power in hierarchical societies (e.g., Japan) relative to egalitarian ones (e.g., the U.S.). In hierarchical societies, we expect to replicate our results from this experiment. People with high Binding foundations would concede morally significant items more to an opponent with a high social status than an opponent with a low social status, while people with low Binding foundations would show the reverse tendency. However, we expect that the overall concession would be greater to the high social status opponents in hierarchical societies compared to egalitarian ones.

Acknowledgments

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