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Choice processes and their post-decisional consequences in morally conflicting decisions

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Abstract

Morally challenging decisions tend to be perceived as difficult by decision makers and often lead to post-decisional worry or regret. To test potential causes of these consequences, we employed realistic, morally challenging scenarios with two conflicting choice options. In addition to respondents' choices, we collected various ratings of choice options, decision-modes employed, as well as physiological arousal, assessed via skin conductance. Not surprisingly, option ratings predicted choice, such that the more positively rated option was chosen. However, respondents' self-reported decision modes also independently predicted choice. We further found that *simultaneously* engaging in decision modes that predict opposing choices increased decision difficulty and post-decision worry. In some cases this was related to increased arousal. Results suggest that at least a portion of the negative consequences associated with morally challenging decisions can be attributed to conflict in the decision modes one engages in.

Keywords: morality, moral dilemma, decision making, decision conflict, values, decision modes, skin conductance, post-decisional consequences.

1 Introduction

Imagine that you are a peacekeeper whose duty is to keep two previously warring factions from fighting. One of the factions starts to shell the town you are in. Thousands of shells fall and suddenly hundreds of people from the other faction are outside your camp, trying to get away from the shelling. You ask your commanding officer for permission to let them in, but are given the strict order not to do so, because it would imperil the perceived neutrality of your unit and could result in the harm of an even greater number of civilians. Do you let them in or turn them away? Regardless of which option you pick, would you be able to move forward effortlessly, forgetting about your decision and its consequences, or would you ruminate over your decision, wondering what would have happened had you decided to take the other option?

Moral choices such as this can be expected to produce more post-decisional rumination than choices without a moral dimension because of the gravity of such decisions. Such decisions seem to lack clear right or wrong options, and they force decision makers to choose what often seems to them to be the lesser of two evils. When decision makers simultaneously embody multiple roles (such as the role of soldier who needs to obey orders versus the role of humanitarian who wants to help), we can expect different decision making strategies leading to different choices and resulting pre- and post-decisional conflict. How then are such moral decisions made and how can they be made in a way that may minimize negative post-decisional consequences?

1.1 Moral choice conflict and consequences

A moral conflict occurs when objectives, values, or ideals that elicit strong reactions in a person compete. Individuals often have a number of social roles that force them to make tradeoffs between simultaneously held sets of values, goals, or interests (Fiske & Tetlock, 1997). A decision maker may consider violating either of these values to be inexcusable, because both values are protected (Baron & Leshner, 2000) or sacred (Tetlock, Kristel, Elson, Green, & Lerner, 2000). This type of choice is considered "tragic", in the sense that no action will go unregretted.

Being forced to make such morally conflicting decisions can have immediate negative consequences for the decision maker. Participants confronted with such a trade-off report experiencing decision difficulty, negative

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emotion surrounding the decision, and diminished confidence in the decision they make (Hanselman & Tanner, 2008; Mandel & Vartanian, 2008).

Engagement in decision conflict might also give rise to negative *downstream* consequences following moral decisions. Indeed, decision research suggests that decision conflict can result in post-decisional worry (Zakay, 1993; Janis & Mann, 1977), regret (Loomes & Sudgen, 1982; Bell 1982; Gilovich & Medvec, 1995; Sagi & Friedland, 2007), and rumination (Handgraaf, Zeelenberg & Manstead, 1997; Savitsky, Medvec, & Gilovich, 1997, as cited in Zeelenberg, Inman & Pieters, 2001).

Peacekeepers, in their daily duties, are exposed to situations involving moral decision conflict. By definition, their duty is to keep the peace, suggesting an emphasis on humanitarian values. At the same time, their military training has taught them to obey authority. It has been argued that conflict between such values contributes to the documented increase in stress that peacekeepers face (Richardson, Naifeh, & Elhai, 2007; Litz, Orsillo, Friedman, Ehlich, & Batres, 1997). Qualitative accounts of peacekeeping soldiers involved in making moral decisions reveal that they question whether they did the right thing afterwards (worry/regret) and replay the scenario in their minds (rumination) (Thompson, Adams & Sartori, 2006). In addition to these cognitive and emotional consequences of moral decisions, it is possible people may suffer physiologically through increased arousal, which has been linked to negative health consequences (Cohen, Kessler, & Underwood Gordon, 1997; Krantz, Glass, Contrada, & Miller, 1981). Indeed worry, rumination, and arousal are considered elements of post-traumatic stress disorder (PTSD; *DSM-IV-TR*, 2000), arguably one of the worst post-decision consequences one could suffer. Understanding the underpinnings of such decision conflict may help elucidate and minimize these negative post-decisional consequences.

1.2 Moral decisions and decision modes

People use a range of qualitatively different ways to arrive at decisions (Weber, Ames & Blais, 2005; Weber & Lindemann, 2007). Although such *decision modes* often operate in parallel, decision makers attend to them to different degrees at different times and contexts, because the modes tend to satisfy different goals (Weber & Lindemann, 2007). Guiding this framework is the assumption that expressed preferences are constructed, and that context, active goals, and activated roles and values determine the construction process. Use of different decision modes often determines choice, because different modes focus attention on different aspects of choice alternatives and the choice environment (Weber & Johnson, 2009).

Decision makers often embody several roles at once, and different roles may give rise to decision modes that lead to conflicting outcomes. Consider again the opening example of a peacekeeper who must balance humanitarian and military roles (and corresponding mode-use). On one hand, the peacekeeper's role as a humanitarian (and the corresponding value placed on helping people) gives rise to modes associated with that value which should lead to the choice of the humanitarian option (let the refugees into the camp). On the other hand, the peacekeeper's role as a militarily trained combat soldier (and the corresponding value placed on authority and obedience) gives rise to modes associated with *that* value, which should lead to the choice of the military option (turn the refugees away). The current study seeks to examine the way mode-use in moral dilemmas and, in particular, multiple mode-use, may give rise to decision conflict and to the negative consequences of such conflict, such as decision difficulty, post-decisional worry, and arousal. We hypothesized that when roles are in opposition and lead to use of opposing decision modes, the result is an increase in these negative consequences.

1.3 Current study

This study employed realistic moral scenarios developed as part of a project with Defense Canada and based on actual experiences of Canadian peacekeepers. Each scenario pits a humanitarian option of helping people against a military option of following orders. Our predictor variables included participants' perceived consequences of each option as well as self-reports of the decision modes they used to arrive at their choices, both hypothesized to influence their choices. Our dependent variables of interest were participants' choice (Humanitarian or Military option) and post-decision measures of how much difficulty participants had making the decision and how much they expected to worry in the future about the decision they made. Skin conductance, measured when participants made their choices, was used as an indicator of arousal.

Consequentialism (for reviews see Darwall, 2003; Pettit, 1993) holds that expected social, emotional, and material consequences should determine choice. If this were followed, the option with the best perceived consequences would be more likely chosen. For example, if the humanitarian option is associated with more positive consequences, it is more likely to be chosen than the military option. In contrast, multiple decision-mode models (Weber, Ames, Blais, 2005; Weber & Lindemann, 2007) predict that use of a specific mode would influence choice, in addition to the perceived consequences of the different choice options. Additionally, they should influence choice in predictable ways.

Researchers focusing on moral decision making in military scenarios have identified several modes important in such decisions: Consequence (weighing costs and benefits), Self-Interest (protecting one's own well-being), Emotion (involvement of emotions and immediate reactions), Care (concern for others), Role (use of scenario-provided role), and Virtue (use of principles) (Catano, Kelloway, & Adams-Roy, 2000; Dursun, Morrow, & Beauchamp, 2003). In the current study, Care and Emotion should predict choice of the Humanitarian option, since "showing concern for another person" and "reacting to the emotions involved", respectively, suggest helping people. Role and Self-Interest should predict choice of the Military option, since "letting your roles determine a course of action" and "looking out for yourself", respectively, suggest following the rules and obeying orders. Use of Consequence (e.g., "weigh potential benefits against risks") and Virtue modes (e.g., "do the right thing") should predict choice of the option that would result in the most favorable outcome, and would be aligned with actions people deemed virtuous, respectively. We had no clear prediction how modes based on Consequence or Virtue would influence choice in our scenarios, as it seemed plausible that positive consequences and virtuousness could apply to either option.

Further, we predicted simultaneous use of modes that predicted opposite choices (incongruous modes; e.g., Care and Rule) would cause participants more difficulty making the decision, and more projected worry in the future. That is, when people make a decision both strongly "showing concern for another person" and at the same time strongly agreeing with "let their roles determine their course of action", we expected them to have a more difficult time eventually making a decision, and similarly, more worry about the decision they made.

Finally, we measured the relationship between conflicting decision modes and skin conductance response as a physiological measure of arousal during decision making. We hypothesized that engaging in incongruous decision modes would also be associated with increased physiological arousal.

2 Method

2.1 Participants

Sixty-three (33 female) participants were recruited using flyers around campus and the Columbia Business School Behavioral Research Lab on-line recruiting system. Their ages ranged from 18 to 61 (M = 28.08, SD = 10.93) and they participated in return for a flat-fee payment of $15 for a single session that lasted approximately half an hour.

2.2 Materials and procedures

Two military moral decisions (Refugee Camp and Supervise Soldier) allowed us to examine our hypotheses and two everyday trivial decisions (Toothpaste and Weather) served as controls (see Table 1). Each scenario provided two choice options. The military moral scenarios were based on real events reported in interviews conducted by the Defense Research and Development Canada (DRDC) with returning peacekeepers (Thompson, Adams, & Sartori, 2006). The military moral scenarios pit a humanitarian option against a military option. The everyday scenarios were chosen from a pool of scenarios that had been rated with respect to their ethical content by a different sample of respondents, and those with lowest ethical content were selected. In the everyday scenarios, none of the choice options had ethical or moral implications.

Participants were presented the four scenarios one at a time, each following the same procedure (all stimuli were presented and responses recorded on the computer). First, participants were presented with the description of a scenario and asked to carefully imagine themselves in the described situation. For example, in the Refugee Camp scenario (the opening example of this paper), participants were asked to imagine themselves in the role of a soldier on a mission trying to keep peace between two warring factions. While guarding the entrance of a camp, a group of refugees outside the camp needs help and requests to enter the camp to find shelter from an attack. However there are strict orders not to help them, in order to retain impartiality. After having read the scenario, participants were presented with two choice options: "I let the refugees in" and "I turn the refugees away," but did not yet register their choice.

Participants were then asked to imagine they were choosing the first option and rated its perceived emotional, social, and material consequences (Table 2; Haidt, 2003; Reidenbach & Robin 1990). Then, participants were asked to imagine they were choosing the second option and answered the same questionnaire as before, but with respect to the second option.

Finally, participants were asked to select their preferred option and answer a series of questions about the scenario as a whole. The scenario was rated for its perceived ethical content, the difficulty they experienced making the decision, the post-decisional worry they anticipated, and the decision modes that they used to make the decision (Catano, Kelloway, & Adams-Roy, 2000; Dursun, Morrow, & Beauchamp, 2003), as shown in Table 3.

This sequence was repeated for each of the four scenarios, which were presented in random order (different for each participant), and with the order of the two choice options in each scenario counter-balanced across respon-

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Table 1: Scenarios and choice options. [Information in brackets was not shown to participants.]

Military ethical
HANDLING WARTIME REFUGEES **[Refugee Camp]**
Imagine that you are the commander of a unit on peacekeeping duty in a foreign country. There are two factions in this country, and you are trying to keep them from fighting. Your orders are to avoid fighting or siding with either faction. One of the factions starts to shell the town you are in. Thousands of bombs fall within 36 hours. Suddenly, hundreds of people from the other faction are outside your camp, trying to get away from the bombing. You contact headquarters for permission to let them in and the response is strict: don't let them in. the concern is that our country must maintain impartiality to be effective in keeping the peace: letting people into our camp makes it look as if we are supporting their faction. Also, if we let a few in, thousands more will try to get in as well. We don't have enough resources to be able to keep them all safe, well-fed, and free from diseases. Which of the following do you pick?
I let them in **[humanitarian-choice]**
I turn them away **[military-choice]**
SUPERVISING A SOLIDER WHO DISOBEYS ORDERS **[Supervise Soldier]**
Imagine that you are the commander of a unit on peacekeeping duty in a foreign country. There are two factions in this country, and you are trying to keep them from fighting. Your orders are to avoid fighting or siding with either faction. One of your subordinates is somebody who has been your good friend for many years. Recently, he has been getting sympathetic to one of the factions. One day, you find out that he has deployed soldiers into this faction's area for protection. This is directly contrary to your orders and to your mission. He needlessly puts soldiers" lives at risk, in an immediate zone of danger. He probably felt strongly that he was saving civilians" lives, and was hoping that you wouldn't find out about it. In a case like this, military rules say that he should be relieved of command and sent for a court-martial. However, you could reprimand him privately instead which may, however, risk your own career if the story comes to light. Which of the following two options do you pick?
I reprimand him privately **[humanitarian-choice]**
I relieve him of command and have him court-martialed **[military-choice]**
Trivial
CHOOSING TOOTHPASTE **[Toothpaste]**
Imagine that you are almost out of toothpaste. You haven't gone a day without brushing your teeth for at least ten years. This situation is unacceptable. You need to make sure that you can get a good teeth brushing tomorrow morning, and tonight you may use up the remaining toothpaste. You're on a tight budget, but toothpaste is a must. You go to the drug store and look for your regular brand of mint toothpaste. When you find it, you see that it costs $3.50 per tube. You notice that there's a generic mint toothpaste that costs $2.00 per tube. You've never tried the generic brand before. Which of the following two options do you pick?
I buy my regular toothpaste
I buy the generic toothpaste
ENJOYING THE WEATHER **[Weather]**
Imagine that it's a beautiful day outside. It's Saturday and you've had a very stressful work week. You are thrilled with the weather and that you have the entire day to relax and enjoy yourself in the outdoors. You decide to either go for a beautiful bicycle ride along the city's river bike-path where you can see the water and the skyline or else perhaps to go for a stroll to your local park for a calming two mile walk around the pond. Which of the following two options do you pick?
I go for a bike ride
I go for a stroll

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Table 2: Judgments of option characteristics (assessed using 7-point Likert-type scales)

Emotional Consequences
When you imagine yourself engaging in this option, how much do you experience each of these emotions? ("Not at all" to "Very much")
Happiness
Sadness
Anxiety
Empathy
Guilt
Shame
Outrage
Desire to punish
Disgust
Anger
Pride
Fear
Social Consequences
How well do the following characteristics describe this option? ("Not at all" to "Very much")
Just
Fair
Morally right
Acceptable to my family
Culturally acceptable
Traditionally acceptable
Violates an unspoken promise
Violates an unwritten contract
Most people would consider this option to be ("Appropriate" to "Inappropriate")
Material Consequences
How risky do you thinks this option is for you? ("Not at all" to "Very")
How beneficial do you thinks this option is for you? ("Not at all" to "Very")
The possible harm to others resulting from this option would be: ("Minor" to "Severe")
The changes of any negative consequences to others occurring as a result of this option are: ("Not at all" to "Very likely")

Note: Option characteristic questions are listed here categorized by the group to which they belong. Participants saw them without any category labels.

dents.[1] In order to assess physiological arousal, electrodermal activity (EDA) was continuously measured, following the recommendations of Figner and Murphy (2011), using AcqKnowledge Software with the Biopac Systems MP150 and a module for EDA (BIOPAC Systems, Inc. Goleta, CA). Two disposable sticky electrodes were applied to the distal phalanges of the middle and the ring fingers of participants' non-dominant hand. The raw EDA signal was converted into a signal reflecting standardized magnitude of skin conductance responses following Figner and Murphy (2011; SCR area bounded by a curve).

3 Results

3.1 Ethical content of scenarios

Using a repeated-measures ANOVA, we verified that the two military moral scenarios were judged by participants to contain more ethical content than the two everyday scenarios, $F(3, 186) = 258.45$, $p < .01$. Bonferroni-corrected post-hoc comparisons revealed that, as expected, there was no significant difference between the two military scenarios on ethical content (Refugee Camp: $M = 6.02$, $SD = 1.61$; Supervise Soldier: $M = 6.06$, $SD = 1.24$), nor between the two everyday scenarios (Weather: $M = 1.46$, $SD = 0.95$; Toothpaste: $M = 1.75$, $SD = 1.33$), but that both ethical scenarios differed significantly from both trivial scenarios (p's $< .001$). Since we were interested mostly in the consequences of decision conflict in moral decisions, we restrict our subsequent analysis and discussion to the two military scenarios.

3.2 Choice

As the two military scenarios were designed to produce moral conflict between the provided response options, with no clear right or wrong choice, we expected the two options to be chosen about equally often. As predicted, in the Refugee Camp scenario, 31 participants chose the Humanitarian option, which prioritized an ethic of helping others, while 32 chose the Military option, which prioritized an ethic of following orders. In the Supervise Soldier scenario, 37 chose the Humanitarian option, while 26 chose the Military option.

3.3 Predicting choice

3.3.1 Option characteristics

The basic assumption of traditional consequentialist decision models is that people select the choice option that

[1] Order did not have an effect on any of the measures, and will not be mentioned further.

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Table 3: Scenario judgments and mode use (assessed using 7-point Likert-type scales)

Difficulty: *How difficult was it for you to choose between the two options ("Not at all" to "Very")*	
Post-decisional worry: *Given the choice you made, if you had made this decision in real life, how often would you worry that you had made the wrong decision? ("Never" to "Very often")*	
Ethical Content: *To what extent does this decision involve ethics and morality? ("Not at all" to "Very much")*	
Modes: *If you had to make this decision in real life, how likely would you be to follow each of the strategies listed below? ("Not at all" to "Very Likely")*	
Care	*Emotion*
Act out of care for others	Follow your gut feeling(s)
Ensure as little harm as possible is done to others	Trust your immediate affective reaction(s)
Show concern for another person/creature	React to the emotions involved
Virtue	*Role*
Do what a person of honor would do	Follow society's laws
Act with integrity	Stick to organizational or social regulations
Do the "right" thing	Let your roles or obligations determine a course of action
Self-Interest	*Consequence*
Protect your own self-interest	Consider whether the ends justify the means
Act in your best interest	Contemplate objectives to be achieved or avoided
Look out for yourself	Weigh potential benefits against risks

Note: Participants saw questions in a random order, without any mode category labels.

offers the greater benefits and/or smaller costs. To test such a model, we predicted choices by the difference in respondents' judgments of the two choice options on the 26 option characteristics, including emotional (e.g., How angry would you feel?), social (e.g., How traditionally acceptable is it?), and material consequences (e.g., How risky is it?).

High multicollinearity between the 26 predictor variables prohibited including them all simultaneously in a regression model. We therefore created a composite score for each of the three categories (Emotional, Social, and Material consequences),[2] after first reverse scoring the negative characteristics of each option, so that all characteristics would relate positively to choice, and then creating a difference score for each dimension (e.g., [rated justness of the humanitarian option] – [rated justness of the military option]), and finally averaging those difference scores within each category.

We analyzed the effect of each of these three predictors on choice using binary logistic regression. In the Refugee Camp scenario, Social and Material consequences were significant predictors of choice. For each point by which the Humanitarian option was judged to be better than the Military option on Social consequences, the probability of choosing the Military option decreased by about half ($.49 = e^{-0.71}$, $p = .02$). For every point by which Material consequences were judged higher for the Humanitarian option, the probability of choosing the Military option also decreased by about half ($.49 = e^{-0.71}$, $p = .02$). Differences in Emotional consequences were not a significant predictor of choice. We found the same pattern in the Supervise Soldier scenario, where Social and Material consequences significantly predicted choice, with a point increase in the difference in Social consequence measure decreasing the probability of choosing the Military option by one-fifth ($.20 = e^{-1.60}$, $p < .01$), and a point increase in

[2] A factor analysis of the characteristic scores confirmed our a-priori grouping.

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Table 4: Summary of individual logistic regression analyses for modes predicting choice.

	Refugee Camp			Supervise Soldier		
Predictor	B	*SE B*	e^B	B	*SE B*	e^B
Care	−0.84**	0.28	0.43	−0.33	0.22	0.72
Emotion	−0.72***	0.20	0.49	−0.29	0.18	0.75
Virtue	−0.52*	0.22	0.60	0.99**	0.32	1.70
Consequence	0.39*	0.19	1.48	0.22	0.22	1.25
Role	1.16***	0.31	3.19	1.76***	0.40	5.81
Self-interest	0.36*	0.17	1.44	0.20	0.17	1.22

Note: e^B = exponentiated *B (odds ratio)*. Choice predictor s (Modes) took values from 1 to 7, with higher values indicating a stronger reliance on that mode. Choice was coded as 0 for *Humanitarian option* and 1 for *Military option* ($e^B < 1$ indicates that participants were less likely to choose the Military option if they strongly relied on the respective mode, *while* $e^B > 1$ indicates an increase in the likelihood to choose the Military option).

*$p < .05$. **$p < .01$. ***$p < .001$.

the difference in Material consequence measure decreasing the probability by about one-third ($.29 = e^{-1.25}$, $p < .01$). Again, differences in Emotional consequences were not a significant predictor of choice.

3.3.2 Decision modes

To test our hypothesis that use of different decision modes would be associated with different choices, we analyzed the effect of using each of the six modes on choice in separate logistic regression analyses for the two scenarios. As shown in Table 4, we found that in the Refugee Camp scenario, all modes were significantly predictive of choice: The Humanitarian option was predicted by Care-, Emotion- and Virtue-based decision modes, while the Military option was predicted by the Consequence, Self-Interest and Role-based decision modes. In the Supervise Soldier scenario, all modes but Virtue exhibited the same pattern,[3] though at lower levels of significance (see Table 4).

Figure 1 shows mode use as a function of choice as a visual complement to the logistic regression analysis. Participants who chose the Humanitarian option used more Care and Emotion modes and less Consequence, Role, and Self-Interest modes than those who chose the Military option, across scenarios. More Virtue was used by participants who chose the Humanitarian option in Refugee Camp, and by those who chose the Military option in Supervise Soldier.

[3]In Supervise Soldier, Virtue changed direction and predicted the Military option. Our measure of Virtue assessed the importance of "acting with integrity," which could apply to either option in this case.

3.3.3 Option characteristics and decision modes

Using a likelihood ratio test, we compared a model predicting choice from option characteristics alone to a model with option characteristics and decision modes. We found that, as hypothesized, the model containing modes predicted choice variance beyond option characteristics alone in both the Refugee Camp ($\chi^2(6) = 18.87$, $p < .01$) and Supervise Soldier ($\chi^2(6) = 21.57$, $p < .01$) scenarios. Similarly, option characteristics had unique predictive power beyond modes alone, i.e., the model predicting choice from option characteristics and modes predicted more variance than the model with modes alone in both the Refugee Camp ($\chi^2(6) = 11.37$, $p < .01$) and Supervise Soldier ($\chi^2(3) = 20.94$, $p < .01$) scenarios.

3.4 Decision difficulty, post-decision worry, and arousal

Because (a) engaging in a specific decision mode was associated with the choice of a specific option and (b) participants often used more than one decision mode, we predicted that simultaneously engaging in incongruous decision modes (modes that predicted opposing choices) should lead to increased difficulty making the decision, more anticipated post-decision worry, and higher levels of physiological arousal.

In order to investigate the effect of simultaneously engaging in incongruous decision modes, we first created composite scores for the modes that predicted the same choice option within each of the two scenarios (Modes that predicted choice of the Humanitarian option = *Humanitarian modes*; Modes that predicted choice of the order following option = *Military modes*). That is, for the

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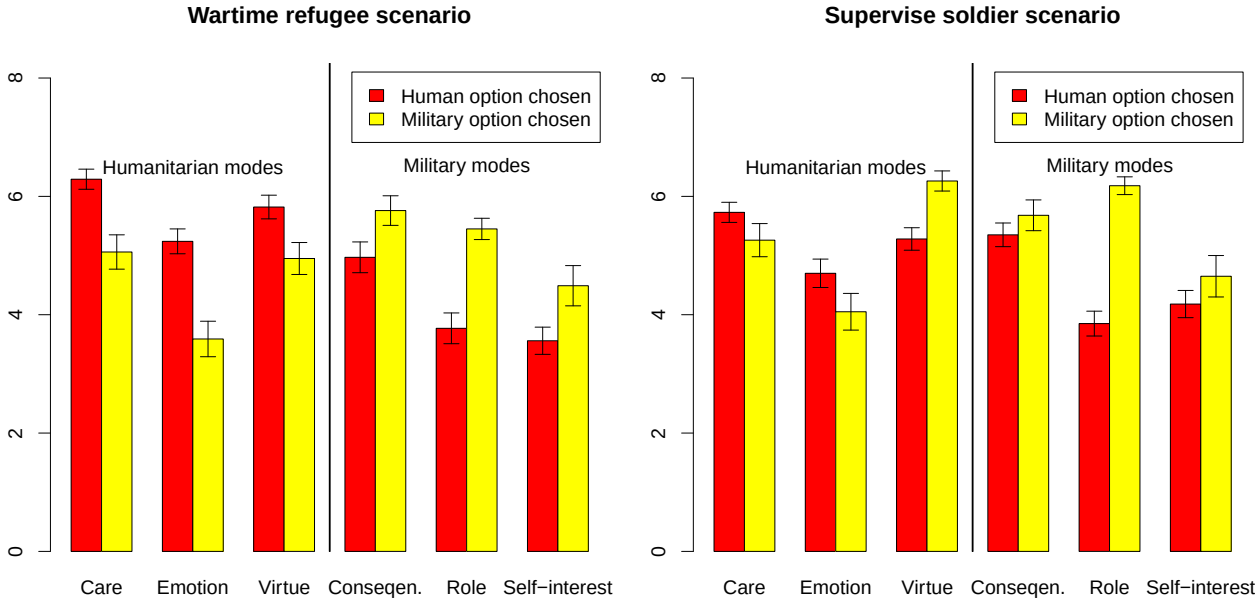
Figure 1: Mean reported mode-use (with *SEM)* by choice of Humanitarian or Military option for the two military-ethical scenarios.



Refugee Camp scenario, the Humanitarian modes composite score was the average of indicated use of the Emotion, Care, and Virtue modes; and the Military modes composite score the average of the Role, Self-Interest, and Consequence modes. For the Supervise Soldier scenario, the Humanitarian modes composite score was the average of indicated use of the Emotion and Care modes, and the Military modes composite score the average of Role, Self-Interest, Virtue, and Consequence.

3.4.1 Difficulty/worry

Decision Difficulty and Post-Decision Worry were positively correlated in each scenario (Refugee Camp: r = .64, $p < .01$, Supervise Soldier: $r = .67$, $p < .01$), suggesting that they assessed highly related aspects of the same construct. Accordingly, we created a composite variable of these two, from here on referred to as *Difficulty/Worry*.

For the Refugee Camp scenario, we first examined the participants who chose the Military option, associated with high levels of using Military modes. We predicted that the extent to which these participants also used Humanitarian modes (i.e., decision modes incongruous to the Military modes) should correlate with increased Difficulty/Worry, because the two types of decision modes pull the participant in opposing directions. Consistent with this prediction, we found a significant correlation between use of Humanitarian modes and Difficulty/Worry ($r = .36$, $p = .05$) for these participants. This result was replicated in the Supervise Soldier scenario (r = .45, p = .02). The results indicate that the consideration of modes incompatible with one's final choice increases both the difficulty of making this decision and worry about it later on.

Next, we tested this same mechanism in participants who chose the Humanitarian option, first in the Refugee Camp scenario. Providing the predicted mirror image, Difficulty/Worry was indeed positively correlated with the reported use of Military Modes (r = .46, $p < .01$). We again replicated this finding in the Supervise Soldier scenario ($r = .33$, $p = .04$).

Finding the same mechanism in all four possible cases provides converging evidence that, regardless of one's final choice, increased engagement of incongruous decision modes leads to increased decision difficulty and increased expected worry later on.[4]

3.4.2 Physiological arousal

The reported results so far have been based on self-report measures of difficulty and anticipated worry and concern. We measured skin conductance as a measure of physiological arousal during the decision to provide an additional consequence of experienced decision conflict and to examine its relationship to the self-reported difficulty in making the decision and projected future worry about the decision (Difficulty/Worry).[5] The measurement win-

[4]The same qualitative pattern of incongruous modes on Difficulty/Worry was found at the individual decision mode level, using medians splits. For example, participants high on both Care and Rule reported more Difficulty/Worry than participants high on only one of those modes, or neither.

[5]Sample size for analyses related to skin conductance was reduced (N = 55), due to issues with data acquisition (electrode adhesion, par-

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dow in each of the scenarios started with the presentation of the scenario and ended when participants chose one of the options.

For participants who chose the Humanitarian option in the Refugee Camp scenario, physiological arousal and Difficulty/Worry were positively correlated, as expected ($r = .55$, $p < .01$). Arousal was also positively correlated with how strongly these participants used Military modes ($r = .40$, $p = .02$), which were incongruous with their final choice. Thus, this result gives some evidence that participants might have experienced choice conflict not just at a cognitive, but also at a physiological level.

Given that (a) the additional use of Military modes predicted Difficulty/Worry (b) Military modes use predicted arousal, and (c) arousal predicted Difficulty/Worry, we tested whether the effect of Military mode use on Difficulty/Worry was mediated by physiological arousal. Indeed, using the SPSS macro developed by Preacher and Hayes (2008), we found evidence for mediation: The effect of Military mode use on Difficulty/Worry (path c) was significantly mediated by the indirect path consisting of the positive effect of Military mode use on arousal (path a: p = .04) and the positive effect of arousal on difficulty/worry (path b: p = .02); crucially, the a x b cross product was significantly different from 0, indicating mediation (a x b: $p < .05$, one-tailed).[6]

For participants who chose the Military option in the Refugee Camp scenario, physiological arousal and Difficulty/Worry were also marginally positively correlated as expected ($r = .21$, $p = .15$). However, Humanitarian mode use was not significantly correlated with arousal.

The results for the Supervise Soldier scenario were more mixed. For participants who chose the Humanitarian option, use of Military modes was not related to arousal in this scenario ($r = –.01$, $p = .39$). Interestingly, however, the level of Humanitarian mode-use (which was *congruous* with their final choice) was *negatively* related to arousal ($r = –.34$, $p = .04$), suggesting that in this scenario, congruous mode use might have *lessened* arousal, rather than incongruent mode use promoting it. The same was true for participants who chose the Military option, though the correlation between Military mode-use and arousal was only approaching significance ($r = –.32$, $p = .07$).

ticipant movement, etc.).

[6]We found the same pattern of results using a simpler test of mediation: M predicts Y in a regression of Difficulty/Worry (Y) onto skin conductance (M) (B = .97, p < .01) and M *also* predics Y in a regression of Difficulty/Worry (Y) onto Military modes (X) and skin conductance (M) (B = .77, p = .02). Although we believe this reflects the underlying relationship between variables, it is theoretically possible that Difficulty/Worry mediates the relationship between Military modes use and arousal or that there is a third varable affecting both skin conductance and Difficulty/Worry (e.g., some internal state).

4 Discussion

Our results provide support for traditional consequentialist as well as for more recent mode-based models of decision making. Consistent with consequentialist models, we found that the option participants rated as more attractive on social and material dimensions was chosen more often. In other words, perceived characteristics of choice options predicted choice. However, our results also show that *modes* of decision making also influence choice, and predict additional choice variance, beyond the effect of characteristics of choice options. However, the focus of the present research was to expand the current literature on decision modes by showing downstream effects when two (or more) incongruous decision modes are simultaneously used. Observing not only increased decision difficulty but also projected future worry sheds light on the potential causes of negative post-decision consequences. Finally, we found preliminary evidence that—even in hypothetical choice scenarios—conflict between incongruous decision modes can be reflected in increased physiological arousal.

Our finding that differences in option characteristics (e.g., perceived riskiness of the Humanitarian option versus perceived riskiness of the Military option) predicted choice is interesting because it provides evidence for a traditional consequentialist decision model, where the option with the greater benefits and/or the smaller costs gets selected. However, we found that not all consequences are equally important for choice. Interestingly, social and material consequences predicted choice, while emotional consequences did not. Emotional consequence scores did vary less than social or material consequence scores, providing one potential explanation. Also, emotional consequences were those for the decision maker, not for others, and a more inclusive measure of emotional consequences might have played a greater role.

However we also found that self-reported mode-use was predictive of choice, a result not predicted by a consequentalist model. Care- and Emotion-based decision modes predicted choice of the Humanitarian option (i.e., helping others), whereas Consequence- and Self-Interest- and Role-based decision modes predicted choice of the Military option (i.e., adherence to the rules) in both scenarios. The Virtue-based decision mode predicted the Humanitarian option in one scenario and the Military option in the other. Taken together, these results provide evidence for the importance of both consequences *and* decision mode use in moral decision making.

Little research on moral decision making has focused on the downstream consequences of such decisions for decision makers. We found evidence that knowledge about the processes people use (i.e., the decision *modes*) to make morally challenging decisions can predict both

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the difficulty they have making these decisions as well as the amount they expect to worry about those decisions in the future and the arousal they exhibit when making these decisions. Specifically, we showed that, when people engage simultaneously in decision modes that predict opposing choices, they have more difficulty making the decision, expect to worry about it more in the future, and, at least under some circumstances, have heightened arousal. This suggests that conflict between simultaneously-held yet contradictory values that get expressed by competing decision modes may be contributing to decision difficulty and post-decision rumination and worry.

Our results resemble—in their safe laboratory minicosmos—recent insights into the often stressful life of real world peacekeeping soldiers: Peacekeepers, in their daily duties, are routinely exposed to morally challenging situations involving decision conflict, and Richardson et al. (2007) reported that up to 20% of peacekeepers return with significant symptoms of Posttraumatic Stress Disorder (PTSD). Interestingly Litz et al. (1997) suggested that decision conflict resulting from competing roles and duties might be a cause of PTSD, which can involve both post-decisional worry and physiological arousal (*DSM-IV-TR*, 2000). Furthermore, in a survey of active duty military personnel who served as peacekeepers in Somalia, soldiers' ratings of the positive aspects of military service were strongly negatively correlated with PTSD, while the intensity of their frustration with the negative aspects of being a peacekeeper was a strong predictor of PTSD (Litz et al., 1997). In other words, when soldiers" ratings indicated that they embraced their role as a soldier (i.e., military service viewed as positive), they were at a lower risk for PTSD, but when their ratings reflected conflict between their role as peacekeeper and as a soldier, they were at a higher risk for PTSD.

Although we do not claim that our scenarios involved the same processes relevant for causing PTSD, it is interesting to note that, by creating scenarios of decision conflict arising from competing roles and examining their influence on worry and arousal, we observed empirical evidence suggesting that there might be indeed a relationship between role conflict and (somatic) decision consequences. We found that worry and skin conductance responses during participants' choice processes in at least one scenario were related to competition between roles and the modes used associated with those roles. Skin conductance reflects activity of the sympathetic branch of the autonomic nervous system (Figner & Murphy, 2011; Boucsein, 1992), which has been implicated in revisiting traumatic events in patients with PTSD (Orr & Roth, 2000). Thus, it is possible that what we observed in our scenarios and what real peacekeeping soldiers experience in traumatic situations have a common basis, just on extremely different scales of magnitude and severity. However, if this is true, our finding that conflict between values during decision making and decision mode use is related to increased skin conductance responses would suggests that the future study into the causes (and perhaps prevention) of PTSD-like phenomena might benefit from measurement of role conflict, decision modes, and physiological arousal. In other words, although they clearly have to be regarded as a first tentative step, our results on the relationship between physiological arousal and decision difficulty and post-decisional worry point to possible ways in which negative consequences related to decision conflict might be studied in the laboratory, and eventually avoided.

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