Choice Processes and Their Consequences in Morally Conflicting Military Decisions

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Abstract

In a study of choice conflict in moral decisions, 63 participants read and evaluated two military scenarios that presented a choice between following a military ethic and a humanitarian ethic, based on accounts from Canadian peacekeepers. Participants' skin conductance, continuously recorded throughout the experiment, served as an indicator of arousal. Not surprisingly, differences in perceived choice option characteristics predicted choice, with participants choosing the option they rated more favorably on multiple characteristics. However, self-reports of the use of different modes of arriving at their decision predicted choice even better. Analytic decision modes predicted following the military ethic, affect-based decision modes predicted following the humanitarian ethic, and the choice that followed rule-based decision modes depended on the scenario. Simultaneous use of modes that indicated opposite choices caused significantly more decision difficulty and post-choice worry. Projections of post-decision worry were related to skin conductance-indicated arousal during decision making. Observed relationships between the use of competing decision modes, arousal, and post-decisional worry in morally conflicting choices may have implications for treatment and prevention of posttraumatic stress in soldiers and peacekeepers.

Keywords: moral decision-making, decision modes, affect and deliberation, skin conductance, PTSD

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Moral judgment and decisions have been studied by philosophers and social psychologists (Singer, 1993; Greene, Nystrom, Engell, Darley & Cohen, 2004; Haidt, 2001), often using quite abstract or stylized decision scenarios (e.g., "trolley" problems, Thomson, 1985), designed to uncover content-independent considerations in such decisions, for example the effects of direct or indirect agency. These scenarios also tend to ask for the simplest of decisions, i.e., whether the decision maker will or will not commit a described act (e.g., pushing a man off a bridge). Different areas of cognitive psychology followed a similar strategy over the course of the 20th century, finding that content-independent processes explained an important part of behavior, especially in the early stages of investigating a particular topic. Thus early memory researchers learned a lot by employing nonsense syllables as stimuli (Ebbinghaus, 1913), and decision research owes many of its early insights to the use of monetary gambles (Edwards, 1954). As these research areas matured however, researchers started to explore processes that use or interact with the specific content of information in need of processing (Goldstein & Weber, 1995), e.g., the use of schemas in memory (Bartlett, 1932) or the use of domain-specific if-then rules in decision making (Cosmides & Tooby, 1992; March, 1994; Weber & Lindemann, 2007). In the field of moral decision making, some investigators from within the judgment and decision making community (e.g., Ritov & Baron, 1999) have started to use less stylized moral decisions. However, these studies still ask respondents for the same go/no go (or push/no push) decisions as the stylized trolley problems.

In this paper, we argue that the time may have come for moral decision research to also start investigating more complex and less stylized decision scenarios. Many morally challenging situations do not just involve the choice of whether to commit or not commit a given act (e.g., to

cheat on one's income tax), but pose a dilemma because they involve two or more courses of action that both seem appropriate or even called for, albeit by separate moral imperatives that mandate different choices. What makes such choices "tragic" is the fact that they pit two sacred or protected values against each other (Baron & Spranca, 1997; Tetlock, Kristel, Elson, Green, & Lerner, 2000), in the sense that no action will go unregretted. It is these kinds of moral decisions, in particular, that can be expected to have post-decision repercussions, such as the persistent revisiting of decisions, and in extreme cases can lead to post traumatic stress disorder (PTSD), which is frequently reported among peacekeeping Canadian (Richardson, Naifeh, & Elhai, 2007) and American (Litz, Orsillo, Friedman, Ehlich, & Batres, 1997) defense forces stationed abroad.

Mention of such possible cognitive, emotional, and physiological consequences of difficult moral decisions suggests another shortcoming of much of decision research, including moral decision-making, namely that studies tend to focus on just part of the decision making process. Judgments, choices, and the process of arriving at them have been studied extensively, whereas both pre-decisional processes (e.g., choice option generation) and post-decisional processes have largely been ignored. Some exceptions, though mostly in the area of risky choice, have examined post-decisional confidence (Zakay, 1993), regret (Loomes & Sudgen, 1982; Bell 1982; Gilovich & Medvec, 1995; Sagi & Friedland, 2007), and differentiation of choice attributes (Svenson, 2001; Shamoun & Svenson, 2002).

In an effort to address some of these previous omissions, we used realistic moral scenarios that required a choice between two conflicting options and investigated the determinants of the decisions, the choice process, and anticipated post-decisional consequences. To preview our results, we found that both the perceived material and social consequences of choice options and the process(es) by which people made their decision (i.e., decision modes)

predicted choice. Further, we found that when people simultaneously engaged in modes that predicted different choices, they rated their decision as more difficult, and expected to worry more in the future about the decision they made. For the more compelling of our two scenarios, we also found a strong relationship between arousal experienced during the decision (as indicated by participants' skin conductance responses, SCR) and self-reports of decision difficulty and predicted post-choice worry.

Posttraumatic Stress Disorder (PTSD)

Peacekeepers, in their daily duties, are routinely exposed to morally challenging situations involving decision conflict. Richardson et al. (2007) report that up to 20% of peacekeepers return with significant symptoms of PTSD, and Litz et al. (1997) suggest that conflict resulting from competing roles and duties might be a cause. While the peacekeepers' main objective is to keep previously warring factions from fighting, they are trained militarily in combat as soldiers and are allowed to use violent force to meet this objective. Due to increased complexity in peacekeeping needs, missions are becoming more like traditional warfare, and it has been suggested that this new hybrid role may produce even more stress than traditional peacekeeping or even traditional warfare (Richardson et al., 2007). 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 peacekeeping was a strong predictor of PTSD (Litz et al., 1997). That is to say, 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. Further exploration of this and other role conflicts might be a key to

understanding stressors that have lasting negative post-decisional psychological consequences and potentially underlie PTSD.

Tradeoffs and Moral Conflict

A moral conflict occurs when objectives, values, or ideals that elicit strong emotional 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). The Fundamentals of Canadian Defence Ethics (2002) identify this as the most commonly known type of dilemma peacekeepers encounter. For example, it is easy to imagine scenarios in which relationships with civilians and relationships with military superiors would be severely at odds. Military membership calls for a strict adherence to rules and an unfaltering obedience to authority. When other values compete, resulting conflict has consequences for the decision maker. For example, in one of the scenarios developed for this study, the decision maker must choose to either obey strict orders from their commander *not* to help a group of refugees in order to maintain impartiality (following a military ethic) or to disobey the orders and help the group of refugees (following a humanitarian ethic). A decision maker may consider violating either of these ethics to be inexcusable, because both values are sacred (Tetlock et al., 2000) or protected (Baron & Spranca, 1997). Mandel and Vartanian (2008) find that participants confronted with this sort of trade-off report experiencing more moral conflict and are less confident in their decision than those confronted with trade-offs involving only one sacred value. In fact, decision makers in such situations are met with harsh judgments of moral outrage if they do not reflect upon such a decision long enough, suggesting that engagement in internal conflict is externally viewed as attention to the gravity of the issue (Tetlock, 2003). That is, someone choosing between two sacred values is expected to have a difficult time making the decision, because there

is no correct choice, as choosing one value means sacrificing the other. However, engagement in such decision conflict could give rise to the negative psychological consequences many peacekeepers return with, such as rumination and revisiting difficult decisions, and increased arousal, as indicated by autonomic functioning. The Diagnostic and Statistical Manual of Mental Disorders (*DSM-IV-TR*, 2000) lists the persistent re-experiencing of the traumatic event as one criterion of PTSD, and arousal is listed as an associated feature. By developing scenarios that involved such conflicting-moral-value decisions, and by examining the decision-making processes respondents engaged in, as well as measuring experienced decision difficulty and expectations of post-decisional worry, we tried to shed light on the link between conflicting values and their consequences, as well as possible mediators and moderators of this relationship.

Decision Modes

Decision research has documented that people use a range of qualitatively different ways to make decisions (Weber, Ames, & Blais, 2005). Weber and Lindemann (2007) provide a useful taxonomy of these decision making processes, referred to as *decision modes*, dividing them into analytic-, affect-, and rule-based modes, with several subcategories of each. While these different ways of making decisions often operate in parallel, decision makers attend to them to different degrees at different times and contexts, because they tend to satisfy different goals (Weber & Lindemann, 2007). Analytic modes that focus on costs and benefits of choice options are most effective in maximizing material goals. Affect-based decisions, in which a decision maker is guided mostly by how s/he feels about the choice options, can be seen as expressions of autonomy, since the decision maker does not seem compelled to explain the quality of their decision to themselves or others. Rule-and-rule based decision modes (especially the subcategory of role-based decisions (March, 1994), where the decision maker's social identity, e.g., being a

doctor or a soldier, provides the rule of conduct, e.g., the Hippocratic oath of always helping people) are ways of affirming affiliations and social ties, because the decision maker is reminded of his or her group affiliation each time s/he makes a decision following a role-based rule of conduct. Cultures in which different types of goals have greater chronic activations (e.g., collectivist vs. individualist countries) tend to show significant differences in the frequency in which different decision modes get employed (Weber et al., 2005). Since different decision modes are associated with different goals and processes, they frequently lead to different choices.

Different conceptualizations of moral choice that have been proposed can be placed into this taxonomy of decision modes. Early models of moral decision making assumed that such decisions are made by purely analytical processes. For example, Kohlberg's model (1969) is analytic in that it describes decision makers as arriving at moral judgments through strict ratiocination about the consequences of different actions. However, just as in other areas of decision making where affect and anticipatory emotions have been found to play a strong role (e.g., Figner, Mackinlay, Wilkening, & Weber, 2009; Loewenstein, Weber, Hsee, & Welch, 2001; Weber & Johnson, 2009), affect has subsequently also been suggested as an important decision process in the domain of moral decisions (Haidt, 2001; Pizarro, 2000; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). In addition, Hare (1981) suggested that people make moral judgments at an intuitive level based on gut-level feelings, but can reason more analytically when given time, training, and motivation to do so. More recently, Haidt (2001) also suggested that moral decision making is far more intuition-driven than previously believed, and that rationalizations about decisions occur only post-hoc, in order to bolster or justify initial affective reactions. Others believe that these moral intuitions can be informed by deliberation

and may be guided by prior reasoning (Pizarro & Bloom, 2003). A recent psychology and neuroscience review by Greene and Haidt (2002) suggests multiple neural systems involving both affect and deliberation may be at work in the processing of moral scenarios. These studies suggest that deliberation, affect, and intuition (whether driven by emotions, analysis, or rules) can be present during the decision making process, often guide decisions, and cannot be ignored when investigating moral decision making.

Previous research has shown the importance of decision modes and of resulting decision conflict on decision confidence (Weber, Bockenholt, Hilton, & Wallace, 2000). For example, contrary to normative Bayesian predictions, the confidence that Welsh medical doctors expressed in a set of diagnostic hypotheses they generated was not associated with the amount of diagnostic information they were provided with, but with the degree of conflict they experienced between competing hypotheses. The current study seeks to examine the way mode-use and, in particular, multiple mode-use, may give rise to decision conflict and its negative consequences, such as decision difficulty and post-decisional worry, in moral dilemmas.

Current Study

The current study explored (a) respondents' choices between competing options in realistic moral dilemmas, (b) their decision mode-use and its potentially mediating role in determining choice, (c) the experienced level of conflict and anticipated post-decision consequences, and finally, (d) the effects of these variables on participants' arousal. We expected (1) perceived option characteristics and mode-use to predict choice, (2) conflicting mode-use to lead to decision difficulty and post-decisional worry, and (3) these self-report variables to be related to physiological arousal, as measured by skin conductance.

Method

Participants

Participants (N = 63) were recruited using IRB-approved flyers distributed across 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). Each participant provided informed consent in accord with the policies of Columbia's Institutional Review Board. A flat-fee payment of $15 compensated for participation in the single session that lasted approximately an hour.

Materials

Participants evaluated four scenarios, shown in Table 1. Two military moral decisions allowed us to examine our hypotheses and two every-day, trivial decisions served as a manipulation check. The military moral scenarios were based on real events reported in interviews conducted by the Defense Research and Development Canada (DRDC) with returning peacekeepers (Thomson, Adams, & Sartori, 2006).[1] The every-day 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. Each scenario provided two choice options. In the military moral scenarios, one option followed a humanitarian ethic of helping others, while the other option followed a military ethic of following orders. Participants rated each scenario for its perceived ethical content, the difficulty they experienced making the decision, the post-decisional worry they anticipated, and their decision mode-use for it (Catano, Kelloway, & Adams-Roy, 2000; Dursun, Morrow, & Beauchamp, 2003), as shown in Table 2. We specified two analytic modes (*Consequence*: weighing costs and benefits, and *Self-Interest*: consequences relevant to participants' own well-being), two affect-based modes (*Emotion*: involvement of emotions and immediate reactions, and *Care*: concern for others), and two rule-

based modes (*Role*: use of scenario-adopted role, and *Virtue*: use of principles). Participants also rated each choice option for its perceived emotional, social, and material consequences (Haidt, 2003; Reidenbach & Robin 1990), as shown in Table 3.

Procedure

Participants were presented with the description of a scenario and asked to carefully imagine themselves in the described situation. For example, in our Refugee Camp scenario, participants were asked to imagine trying to keep peace between two warring factions. One group of refugees needs their help, and requests to enter a camp to find shelter from an attack, but there are strict orders not to help them, in order to retain impartiality. Participants were then asked to imagine they were choosing the first of two possible options, "I let the refugees in," and answered a series of questions about this option. They were then asked to imagine choosing the other option, "I turn the refugees away," and answered questions about this choice option. Participants were then asked to select their preferred option and answered a series of questions about the whole scenario. This sequence was repeated for each of the four scenarios, presented in random order, with the order of the two choice options in each scenario counter-balanced across respondents.[2]

Physiological Measurement

Skin conductance measurement and analysis followed the recommendations of Figner and Murphy (in press). Measurement began with the simultaneous presentation of the two choice options and continued until the participant made their decision.

Results

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 every-day 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 (Refugee Camp: $M = 6.02$, $SD = 1.61$; Supervise Soldier: $M = 6.06$, $SD = 1.24$), nor between the two every-day 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 military scenarios, we restrict our subsequent analysis and discussion to the two military scenarios.

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 obedience. In the Supervise Soldier scenario, 37 chose the Humanitarian option, which prioritized an ethic of helping others, while 26 chose the Military option, which prioritized an ethic of obedience.

Predicting Choice

Option characteristics. The basic assumption of traditional, consequentialist decision models is that people select the choice option that 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 variables prohibited including them all in a regression model as independent predictors. Because of this, we created a composite score for each of the three categories (Emotional, Social, and Material consequences).[3] To do this, we first reverse scored the negative characteristics of each option, so that all characteristics would relate positively to choice. We then created a difference score for each dimension (e.g., [rated justness of the humanitarian-ethic option] – [rated justness of the military-ethic option]), and averaged those difference scores within each category.

We analyzed the effect of these three predictors on choice using binary logistic regression analyses. 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 odds 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 odds 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 odds of choosing the Military option by one-fifth ($.20 = e^{-1.60}$, $p < .01$), and a point increase in the difference in Material consequence measure decreasing the odds by about one-third ($.29 = e^{-1.25}$, $p < .01$). Again, differences in Emotional consequences were not a significant predictor of choice.

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 the Affect-based decision modes (Care and Emotion) and a Rule-based mode (Virtue), while the Military option was predicted by the Analytic decision modes (Consequence and Self-Interest), and the other Rule-based mode (Role). In the Supervise Soldier scenario, all modes but Virtue exhibited the same pattern,[4] 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.

In order to investigate the effect of simultaneously engaging in contradicting decision modes (see following section), we first created composite scores for the modes that predicted the same choice option within each of the two scenarios (Humanitarian option predicting modes = *Empathy modes*; Military option predicting modes = *Obedience modes*). That is, for the Refugee Camp scenario, the Empathy modes composite score was the average of indicated use of the Emotion, Care, and Virtue modes; and the Obedience modes composite score the average of the Role, Self-Interest, and Consequence modes. For the Supervise Soldier scenario, the Empathy modes composite score was the average of the Emotion and Care modes, and the Obedience modes composite score the average of Role, Self-Interest, Virtue, and Consequence.

Decision Difficulty, Post-Decision Worry, and Arousal

Since multiple decision modes predicted choice and many respondents indicated that they used more than one mode to reach their decision, we hypothesized that participants who simultaneously engaged incongruous modes (i.e., modes that predicted different choices) would experience more difficulty making the decision, more anticipated post-decision worry, and higher levels of physiological arousal. For example, if a participant reported high use of one or more modes predicting choice of the Humanitarian option (Empathy Modes) and, at the same time, high use of one or more modes predicting choice of the Military option (Obedience Modes), we expected them to report more difficulty and worry and exhibit higher physiological arousal. 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.

Difficulty/Worry. Consistent with our hypotheses, Difficulty/Worry was positively correlated with the reported use of Empathy modes for participants who chose the Military option (and thus also engaged in high levels of Obedience modes) for both the Refugee Camp ($r = .36$, $p = .05$) and the Supervise Soldier scenario ($r = .45$, $p = .02$), indicating 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. As we saw earlier, participants who chose the Military option used more Obedience modes. For the participants who simultaneously strongly used Empathy modes, conflict is likely to result as the two types of modes pull the decision maker in two opposing directions. As a result, the decision was more difficult to make and they expected to worry more about it in the future. Providing a mirror image, Difficulty/Worry was positively correlated with the reported use of Obedience Modes for participants who chose the

Humanitarian option in the Refugee Camp ($r = .46$, $p < .01$) and the Supervise Soldier scenario ($r = .33$, $p = .04$), showing that, regardless of one's final choice, the engagement of choice-incompatible decision modes led to increased decision difficulty and expected worry later on.

The effect of competing modes on Difficulty/Worry can be visually demonstrated using median splits of individual decision modes. Being in either the top or bottom half of self-reported use for each of the six modes can be used as a proxy for whether a participant engaged in the mode or not. For each pair of modes, we thus had three groups: participants who engaged both modes, neither mode, and only one mode. All possible permutations of pairs of modes were analyzed using univariate ANOVA analyses with Difficulty/Worry as the dependent measure, and Mode Groups as fixed factors. We expected pairs of modes that predicted opposing choices (e.g., Care, which was more frequently used by participants who chose the Humanitarian option, and Consequence, which was more frequently used by participants who chose the Military option) to result in the highest levels of reported Difficulty/Worry. As expected, many pairs produced significant interactions (Refugee Camp: Care/Consequence, F (2,60) = 8.08, $p < .01$, Care/Role, F (2,60) = 4.23, $p = .02$, Care/Self-Interest, F (2,60) = 4.73, $p = .01$, Emotion/Consequence, F (2,60) = 5.91, $p < .01$, Virtue/Consequence, F (2,60) = 5.99, $p < .01$; Supervise Soldier: Care/Self-Interest, F (2,60) = 3.13, p = .05). Post-hoc Boniferroni tests revealed that participants who used both modes experienced more Difficulty/Worry compared to those who used only one mode, or neither modes. Figure 2 shows this pattern for one pair of conflicting modes, Care and Consequence. Difficulty/Worry was low when neither or one of these two modes was being used, but increased significantly when both modes were being used. All other pairs of conflicting modes showed the same qualitative pattern on Difficulty/Worry.

Physiological arousal. Most of the reported results so far have been based on self-report measures. We measured skin conductance to provide an additional, physiological consequence of conflicting decisions, indexing arousal. Arousal is considered to be an associated physiological feature of PTSD (*DSM-IV-TR*, 2000), and PTSD patients show increased arousal when thinking about traumatic incidences (Orr & Roth, 2000). Since we could not measure participants' actual arousal while revisiting these decisions in the future, we assessed their physiological arousal *during* the decision and examined its relationship to the self-reported difficulty in making the decision and projected future worry about the decision (Difficulty/Worry).

For the Refugee Camp scenario, physiological arousal and Difficulty/Worry were positively correlated, but only for participants who chose the Humanitarian option ($r = .55$, $p < .01$). For these participants, arousal was also positively correlated with their level of engagement of Military option-predicting modes ($r = .40$, $p = .02$), giving evidence that participants experienced choice conflict not just at a cognitive level, but also at a somatic level. Given that (a) conflicting modes predicted Difficulty/Worry (b) conflicting modes predicted arousal, and (c) arousal predicted Difficulty/Worry, it is possible that arousal mediates the effect of conflicting modes on worry. Before arousal is entered as a mediator, the level of Military option-predicting modes is significantly related to Difficulty/Worry (as discussed earlier), $\beta = .46$, $t(23) = 2.56$, $p = .02$. However, once arousal is entered as a mediator, this effect is no longer significant, $p = .14$, and a Sobel test ($z = 1.57$, $p = .12$) confirms a mediation model approaching, but not reaching, significance, likely due to our reduced sample size for this test.[5] In contrast, arousal was not related to Humanitarian option-predicting modes for participants who chose the Military option in the Refugee Camp scenario.

In the Supervise Soldier scenario, for participants who chose the Humanitarian option, use of Military option-predicting modes was positively related to Difficulty/Worry, but not arousal. However, Humanitarian option-predicting mode-use was negatively related to arousal (r = -.39, p = .05), suggesting that in this scenario, congruous mode use seems to lessen arousal, rather than incongruent mode use promoting it. The same was true for participants who chose the Military option, though not at a significant level (r = -.33, p = .15).

There were no corresponding significant results for participants who chose the Military option in the Refugee Camp scenario, nor in the Supervise Soldier scenario.

Discussion

A practical goal of the present research was to examine the effect of decision conflict (recently suggested as a possible cause of Posttraumatic Stress Disorder, PTSD (Litz et al., 1997)) on post-decisional worry and physiological arousal, both considered elements of PTSD (*DSM-IV-TR*, 2000). At a theoretical level, we were trying to expand the range of typically studied moral dilemmas to naturalistic (rather than stylized) scenarios and to choices between multiple choice options (rather than go/no go decisions). For this purpose, we constructed two morally challenging military scenarios, based on evidence of situations reported as inducing decision conflict and posttraumatic stress in returning Canadian peacekeepers.

We found that differences in option characteristics (e.g., perceived riskiness of the Humanitarian option versus perceived riskiness of the Military option), predicted choice. Not surprisingly, people chose the option rated as more positive on Social and Material consequences, while differences in Emotional consequences did not influence choice. This provides evidence for a traditional consequential decision model, where the option with the greater benefits and/or the smaller costs gets selected. However, we also found that self-reported

mode-use was predictive of choice. Affect-based decision modes predicted choice of the Humanitarian option, whereas Analytic decision modes predicted choice of the Military option (i.e., adherence to the rules). Taken together, these results provide evidence for the importance of both affect and deliberation in moral decision making, in line with multiple-systems models of decision making, but argue for a different model of their relative contributions than previously suggested. Rather than automatic affect-laden intuitions driving the decision and deliberation providing the justification (Haidt, 2001), or rational thought shaping those automatic affect-laden intuitions (Pizarro, 2003) our results indicate that different modes of processing operate in parallel, albeit to different degrees in different individuals, but may be associated with different choices in the more morally-complex decision situations employed in our study. Monin, Pizarro, and Beer (2007) have also argued for the importance of dismantling the reason and emotion dichotomy, and for specifying their use across different types of moral questions.

Most closely related to possible implications for PTSD, we found that when multiple modes that predicted opposing choices were engaged simultaneously, participants reported more difficulty making the decision and predicted they would worry more about the decision in the future. This suggests that conflict between simultaneously-held yet contradictory values that get expressed by competing decision modes may be contributing to the difficulty people experience in making decisions, and may be predictive of post-decision rumination and worry.

Although they 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 decision-related processes potentially underlying PTSD might be studied in the laboratory. We found that skin conductance responses during participants' choice processes in at least one scenario were related to self-reports of decision difficulty and expectations that they

would later-on worry about their decision. As skin conductance reflects activity of the sympathetic branch of the autonomic nervous system (Figner & Murphy, in press; Boucsein, 1992), which in turn has been implicated in revisiting traumatic events in patients with PTSD (Orr & Roth, 2000), we believe our finding that conflict between values during decision making is related to increased skin conductance responses suggests that the future study of the causes and prevention of PTSD would profit from measurement of physiological arousal.

We conclude that conflict between roles and the subsequent simultaneous engagement of decision modes contributes to post-decision rumination and heightened physiological arousal, which are key components of the posttraumatic stress many peacekeeping soldiers report upon their return from duty. These findings should be considered in future investigations of the causes and consequences of PTSD, and may have significant bearing on treatment and eventual prevention.

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Footnotes

[1] While our two military ethical scenarios were designed to similarly evoke competing moral values, they differed in a number of ways. For the following reasons, we consider *Refugee Camp (RC)* to be more compelling than *Supervise Soldier (SS)*, and we believe it more thoroughly induces the effects we intended to study; that is, the effect of moral conflict on decision difficulty, post decision worry, and physiological arousal. The scenarios differ in a number of ways, but the components of Moral Intensity (Jones, 1991) capture the most salient differences:

Magnitude of Consequences (sum of the harms done to victims): In *RC,* hundreds of lives may be lost or compromised. In *SS*, only one friendship can be betrayed. Thus in the former, many *more* people are affected, and to a *greater degree.*

Social Consensus (degree of social agreement that a proposed act is evil or good): In *RC,* each option was chosen approximately equally frequently, suggesting there is little social consensus as to which is the "right" choice. In *SS,* the humanitarian-ethic option was favored slightly, suggesting more social consensus.

Probability of Effect (probability that the act in question will occur and that it will cause the harm predicted): In *RC,* the outcome of the decision is unknown. *SS,* on the other hand, offers a concrete choice in which the outcome is known.

Temporal Immediacy (length of time between the present and the onset of consequences): In *RC,* the onset of the consequences of either decision is almost immediate. In *SS,* one of the choices is immediate, while the other might produce effects at an unknown time in the future.

Proximity (feeling of nearness [social, cultural, psychological, or physical] of the agent to the victims): In *RC*, the victims are unknown and culturally different. In *SS*, the victim is a friend and fellow soldier.

Concentration of Effect (inverse function of the number of people affected by the magnitude): In *RC,* many people are affected by a dramatic outcome, while in *SS*, only one person is affected by a much less severe outcome. It is unclear which scenario has a more concentrated effect, as losing one's job is incomparable to losing one's life. However, it is obvious the two do differ on this dimension.

Thus, *Refugee Camp* and *Supervise Soldier* differ on all dimensions of Moral Intensity. Jones (1991) describes these as important determinates of moral decision making and behavior. More recent research has shown that some of these dimensions affect both construal level and moral evaluation (Eyal, Liberman, & Trope, 2008). We believe the combination of higher magnitude of consequences and temporal immediacy and lower social consensus and certainty make *Refugee Camp* more compelling and that these differences can help explain the stronger effects we find in this scenario.

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

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

[4] In Supervise Soldier, Virtue changed direction and predicted the Military option. Our measure of Virtue assessed the importance of "acting with integrity." It seems that this took on a different meaning depending on the scenario (see Footnote 1 for a review of scenario differences).

[5] Sample size for analyses related to skin conductance was reduced ($N = 47$), due to issues with data acquisition (electrode adhesion, participant movement, etc.).

Table 1

Scenarios and Choice Options

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-ethic]**
	I turn them away **[military-ethic]**
	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-ethic]**
	I relieve him of command and have him court-martialed **[military-ethic]**
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

Table 2

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'*)	
Affect-based	
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
Rule-based	
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
Analytic	
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. Mode questions are shown here according to which group they belong. Participants saw them in a mixed order, without mode or group labels.

Table 3

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 shown here according to which group they belong. Participants saw them without labels.

Table 4

Summary of Individual Logistic Regression Analysis for Modes Predicting Choice

	Refugee Camp			Supervise Soldier		
Predictor	B	*SE B*	e^B	B	*SE B*	e^B
Care	-.84**	.28	.43	-.33	.22	.72
Emotion	-.72***	.20	.49	-.29	.18	.75
Virtue	-.52*	.22	.60	.99**	.32	1.70
Consequence	.39*	.19	1.48	.22	.22	1.25
Role	1.16***	.31	3.19	1.76***	.40	5.81
Self-Interest	.36*	.17	1.44	.20	.17	1.22

Note: e^B = exponentiated *B (odds ratio)*. Choice predictors (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).

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

Figure 1. Mean mode-use (+ 1 *SEM)* by choice of Humanitarian or Military option for the (A) Refugee Camp and the (B) Supervise Soldier scenarios.

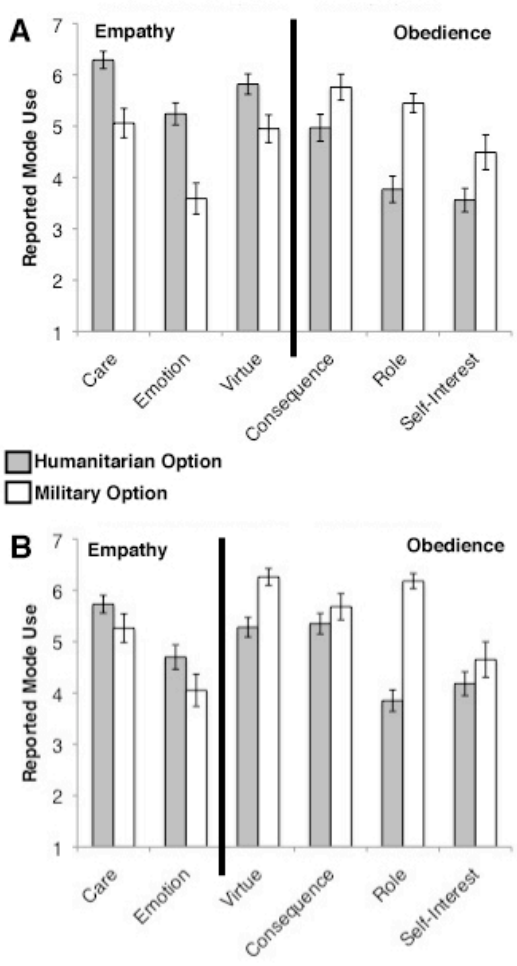

Figure 2. Mean Difficulty/Worry (+ 1 *SEM)* for participants who used Neither Mode (n = 20), One Mode (n = 27), and Both Modes (n = 16). This example shows the Care and Consequence Modes in the Refugee Camp Scenario. All pairs of modes that reached significance exhibited this same pattern.