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# Colliding sacred values: a psychological theory of least-worst option selection

Neil Shortland[a,b] and Laurence Alison[b]

[a]Center for Terrorism and Security Studies, Criminology and Justice Studies, University of Massachusetts Lowell, Lowell, MA, USA; [b]Department of Psychological Sciences, Centre for Critical and Major Incident Research, University of Liverpool, Liverpool, UK

### ABSTRACT

This paper focuses on how Soldiers make hard choices between competing options. To understand the psychological processes behind these types of decisions, we present qualitative data collected from Soldiers with combat experience (e.g., in Afghanistan and Iraq). Using a grounded theory approach, we develop a testable and falsifiable theory of least-worst decision-making. Specifically, we argue that the process of choosing a least-worst option centres on an individuals' ability to select between colliding values. Redundant deliberation describes the process that occurs when two equally "sacred" (non-negotiable) values collide during which, we argue, the decision maker calculates that each outcome is intolerable and cannot choose between them. As such, they fail to act in time (or at all) – resulting in decision inertia. However, in instances of a single (rather than colliding) sacred value, individuals are more readily able to commit to a least-worst choice of action. This theory of "colliding sacred values," if further validated, offers important theoretical implications for the role of value systems in understanding naturalistic decision-making – specifically with regards to making decisions in extreme conditions of uncertainty.

## Introduction

A hungry donkey stands between two identical hay piles. The donkey always chooses whichever hay is closest to him. Both piles are exactly the same distance apart, one on his right, one on his left, and they are identical in every way. Which pile of hay will the donkey choose to eat?

The French Philosopher Jean Buridan proposed the above argument as an argument against free will. Whilst originally outlined by Aristotle, Buridan made the paradox famous. Buridan stated that because the donkey cannot

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choose between completely equal options he starves to death whilst deliberating. While commonly used in political satire, this philosophical conundrum reflects the common observation that when people face equally attractive (or unattractive) choices they can become paralyzed in "over thinking" the choice.

In naturalistic decision-making, based on findings from research on decisions in real-life critical incidents, researchers have called these types of decisions "least-worst" (see Alison et al., 2015; Power & Alison, 2017a, 2017b). Least-worst decisions are those in which every course of action is high-risk and could (potentially) have negative consequences. Further, and even more demanding, is the fact that the decision maker considers that all anticipated outcomes appear equally aversive (or that choosing between the least-worst quickly is very difficult). These kinds of decision are a challenge for current perspectives on decision-making that are based on the premise that there is an *ideal*, *best*, or *workable* solution to a problem (e.g., Klein, 1993, 1998, 2008, 2011). Instead, and as shown by Alison et al. (2015) and van den Heuvel, Alison, and Crego (2012), decision-making is usually derailed when individuals find themselves in the "zone of indifference" and, thus become, inert. In Buridan's terms; the donkey starves because it cannot calculate any meaningful difference between the two bales of hay.

### *The need for a grounded theory approach*

Research on decision-making has traditionally been conducted in the laboratory (e.g., Chaiken & Trope, 1999; Kahneman & Frederick, 2002) or in the field where researchers observe decision-making first hand (e.g., Klein, 1998). Both laboratory and naturalistic research on least-worst decisions has identified various forms of decision inertia. One specific form subcategory of decision inertia pertinent to Buridan's Ass is "redundant deliberation (RD) over choice for no positive gain" (Alison et al., 2015). Unlike other forms of inertia, RD is cognitively demanding – it involves constant "looping" between options and information searches – even when it becomes evident that there is no more useful information to inform the choice. RD becomes especially pronounced when stakes are high and when all outcomes look equally aversive. Surprisingly though, the actual articulation of these "looping" cognitions has rarely been captured and, instead, most research has simply argued that RD occurs, that it leads to decision inertia and that it has significant negative consequences (Power & Alison, 2018). This lack of rich description as to what the decision maker is actually considering lends itself to adopting a qualitative approach to studying decision-making. The goal of qualitative research is to develop concepts that help us understand a phenomenon in the natural world (Pope & Mays, 1995). Qualitative

methods sometimes serve as an important first step in developing theories and hypotheses that can then be tested quantitatively through the hypo-thetico-deductive method (see Teddlie & Tashakkori, 2009).

For the following we adopt a grounded theory approach to the process of least-worst option selection. Grounded theory is a general methodology used systematically to develop theories that are emergent from, and grounded in, data (Glaser & Strauss, 1967). The theory itself evolves during the research and is the outcome of a dyadic data-collection-analysis process (Strauss & Corbin, 1994). Glaser and Strauss originally proposed grounded theory in 1967 as a practical method by which one can conduct research that focuses on the interpretive process. They argued for the analysis and "actual production of meanings and concepts used by social actors in real settings" (Gephart, 2004, p. 457). What separates grounded theory from other forms of qualitative analysis using the same data (interviews, observations, historical reports, etc.) is the unwavering focus on developing substantive theory. Grounded theory is therefore especially useful for situations that have not been previously studied or where existing research has left deficits in knowledge (Schreiber & Stern, 2001).

## Decision inertia

Research on decision-making has increasingly turned its focus to the psychological phenomenon of indecision. Contrary to decision avoidance where a choice is delayed, ignored, or deferred, (outlined by Anderson, 2003) decision inertia is defined as "the redundant cognitive deliberation of choice for no positive gain" (see Alison et al., 2015). Thus, what separates decision inertia (a negative outcome) from more general indecision or avoidance (which can be positive when it prevents hasty or reckless decisions; Janis & Mann, 1977; Kahneman & Lovallo, 1994) is the fact that, despite the individual's motivation to act, they struggle to commit to a choice (either cognitively, or behaviourally). A central facet of RD is that the decision-maker fails to decide within an "ideal" timeframe. RD is therefore especially relevant in time-sensitive situations (e.g., economic, critical incident, foreign policy, or military) since delay and inaction could be even worse than selection of one of the bad outcomes. This also separates decision inertia from the concept of hypervigilance proposed by Janis and Mann (1977). Hypervigilance involves poor decision-making due to the *perception* of insufficient time; decision inertia involves the inability to decide *at all* within a given timeframe.

RD occurs between the "option generation" and "option evaluation" stage of decision-making and involves an active, engaged, effort to decide. Decision-makers are more likely to engage in redundant deliberation when they are faced with "least-worst," options, i.e., those in which all choices

offer a potential negative outcome and are high-risk. Naturalistic research has shown that on members of the police, fire and ambulance services are prone to decision inertia when faced with a least-worst decision (Power & Alison, 2017a; van den Heuvel et al., 2012).

## This study

Despite a lack of studies on the psychology of "doing nothing" (Anderson, 2003), researchers are increasingly documenting and attempting to study decision inertia (e.g., Alison et al., 2015) and the conditions under which it emerges (e.g., Power & Alison, 2017a, 2017b; van den Heuvel et al., 2012). However, no research from naturalistic fields has, to date, explored the process and cognitive considerations that an individual goes through when *making* a least-worst decision (see Alison, Power, van den Heuvel, & Waring, 2015). We do not know how people decide between least-worst options nor how they decide upon on a course of action. More importantly, we do not know why, in the same situation, some individuals will become stuck in a process of redundant deliberation, while others push forward and commit.

This study takes a grounded theory approach with a view to identifying the psychological processes that underpin choice selection in high-uncertainty environments. To do this, we focus on a specific subpopulation (namely members of the Armed Forces). Previous research suggests this population may be more resistant to redundant deliberation in the face of least-worst decisions (Shortland, Alison, & Moran, 2019). By focusing on this population (rather than, as with previous research, Police, Fire, and Emergency Services; Alison et al., 2015; Power & Alison, 2017a, 2017b) we hope to provide a more general theory of how such decisions *are* made, rather than how they *are not* made.

## Method

### Participants

Twenty-seven members of the Armed Forces were recruited and interviewed as a part of this study. Because our interest was not on a specific *type* of decision being made (except that they had to be least-worst to meet inclusion criteria), individuals were not restricted by their branch, length of service, rank or role. Participants were opportunistically sampled, and contacted via gatekeepers to be recruited for a study that sought to "understand the situations within which decision-makers can spend too much time considering the options available to them, potentially leading to inaction." Gatekeepers included those with access to members of the

United States Armed Forces. Participants covered four major branches of Armed Service (Air Force, Army, Navy and Marine Corps) and represented a range of ranks. Three participants were female (11.11%), which reflects the general gender split within the Armed Forces (16.19% female; U.S. Army, 2016). Each participant was interviewed once, and each participant provided one least-worst decision, which they were asked to discuss in detail. On average, each interview lasted over 1 hr (*median* = 87 min 49 sec, range = 96 min 18 sec). Overall these interviews resulted in 172,379 words of text related to their articulation of psychological process of making a least-worst decision.

## Critical decision method

Critical decision method interviews (CDM) seek to understand decision-making in a specific, often unique, incident that a practitioner faced in the real-world. CDM therefore provides a method of collecting, in retrospect, insight into practitioners' decision-making processes. CDM helps practitioners "tell stories" in a single incident-centric method and requires that the participant select and recall a single incident in detail. In doing so, it allows researchers to gather information on the incident, the incidents' background, and the individuals' cognitive functions during the event (such as planning and sense making). It also allows researchers to identify critical decision-points. CDM, therefore, develops rich and detailed data on the cognitive processes used by experts when responding to challenging events (Crandall, Klein, & Hoffman, 2006).

Our CDM interviews started with this statement:

> I am going to be asking you in a moment to spend some time thinking about a decision that you had to make, while in the Armed Forces, in which you had to choose between one or more options and in which you spent a lot of time thinking about all the possible outcomes.

A series of sample decisions provided by participants in response to this cue is provided in Table 1.

CDM involves an extensive interview and has previously been used to elicit data points for decision-making in nurses (Crandall & Getchell-Reiter, 1993), ambulance dispatchers (Wong & Blandford, 2004) intelligence analysts (Hutchins, Pirolli, & Card, 2004), pilots (Plant & Stanton, 2013), diagnosticians (Islam, Weir, Jones, Del Fiol, & Samore, 2015), ophthalmic surgeons (Pauley, Flin, & Azuara-Blanco, 2013) and military command and control (Pascual & Henderson, 1997). CDM interviews involve four "sweeps," with each sweep using different types of probes and perspectives to facilitate the quality of recall (Crandall et al., 2006). The first sweep results in the selection of an incident that matches the requirements of the research and

Table 1. Sample least-worst decisions provided by participants.

| Decision outline |
| --- |
| Soldier goes outside the wire to meet a "walk-in" who has potential intelligence on improvised explosive devices (IEDs) in the local area. When meeting the "walk-in" a Sports Utility Vehicle car pulls towards them aggressively. Could be a vehicle-bourne IED, or not. Soldier is placed in a shoot/don't shoot scenario. |
| Convoy driver is providing rear-security to convoy carrying gas to second base. Encounters a civilian acting in an aggressive manner (could be insurgent). After this situation is diffused, as they proceed, a car approaches them at a very fast speed (could be a vehicle-bourne IED, VB-IED). Gunner fails to act, forcing convoy driver to take action to intercept this potential VB-IED and protect the convoy. |
| Driver sets out on convoy, plans route and leaves the base. On the route they find that the routes they had planned (routes A, B and C) are all unavailable to them. While at the roundabout the team leader had to decide 1: do we pull over and decide on a new route (making them a target); 2 go down route D (a known hot-bed of insurgent activity that would very likely end up in a fire-fight); or 3 turn around and go back the way they came (which is heavily frowned upon as once you have travelled a route insurgents often lay IEDs ready for your next trip through). |
| Platoon leader/Squadron commander is leading a "clear" operation in an insurgent village that is a known hot-bed of IED-making activity. During this approach they encounter insurgent fire, losing two members of that platoon and requiring medical evacuation. The operation continues, and they come pinned under fire in the village. Squadron leader decides to draw fire and provide cover. The platoon then continues the operation until they re-encounter fire. At this point the platoon decides to evacuate the operation through the side of the village. During this evacuation the Soldiers tread on 3 buried IEDs causing multiple Soldiers to be wounded. Evacuation is arranged and they return to the base. |
| A drone pilot was charged with determining whether ambiguous activity they could witness through their feeds was "hostile" (i.e., embedding an IED) or non-hostile (i.e., digging for fruit). If decided hostile they would engage, potentially causing civilian casualties, if hostile and they didn't engage, they could be leaving fellow Soldiers at risk. |
| Marine commander was required to decide if they can and should set up an indigenous force in their local area. There were many benefits to doing this, however in doing so they would open that area (and the civilians in it) to enemy targeting. |
| Special ops – two tactical teams out in the field, both requesting air support. The operator has to decide, which, if either, he is to provide air support to. |

the goals for data collection. Usually, CDM focuses on non-routine decisions and challenging events because these have the greatest potential for uncovering aspects of a given cognitive phenomenon. This is also important to ensure that the interview catches cognitive processes beyond procedural and routine knowledge, allowing insight into the characteristics of skilled and expert performance (Crandall et al., 2006). Once a candidate event has been identified, the interviewee is asked to recall the event from start to finish. The second sweep involves the participant developing a visual (or verbal) timeline of the event. In developing a timeline, participants are encouraged to highlight "critical points" during which the decision-maker experienced a major shift in their understanding of an event, or an action was taken that changed the event (Crandall et al., 2006). During the second sweep inconsistencies, gaps, and missing elements are also identified, allowing the interviewer and interviewee to arrive at a shared view of the facts. The third sweep involves "deepening", within which the interviewer uses a series of cues to investigate the practitioners' cognitive experience of the event (i.e., their expectations, mental models,

assessment). The third sweep goes beyond the timeline to seek out the participant's perceptions, expectations, goals, and uncertainties during the incident. During this sweep, the interviewer uses probes for additional information and elaboration from the participant. These probes are shown in Table 2. The final sweep of the CDM involves questioning the "what if's" of an event. In this sweep a series of probes aimed at identifying hypothetical factors (within the environment, or the decision-maker) that would have resulted in a different outcome or experience (see Crandall et al., 2006, pp. 69–83).

One of the distinct advantages of CDM then is that decisions are explored *post hoc*, rather than *in situ*, meaning that detailed data can be collected without putting the researcher (or more importantly the participant) in harm's way. In fact, the CDM was developed in part due to issues collecting data on the decision-making of firefighters while "in action" (see Crandall et al., 2006). CDM has several other benefits; it gives indications of the cues and patterns that experts perceive; "rules of thumb" they have devised; the kinds of decisions they are required to make; as well as features of tricky, typical and rare decisions (Crandall et al., 2006).

## Grounded theory and theoretical sampling

Grounded theory, as outlined by Glaser and Strauss (1967) features two central components; constant comparison and theoretical sampling. Constant comparison (as noted above) emphasizes the fact that data collection and analysis co-occur and interplay with each other. Hence, as analysis of the data occurs, the method can change to further explore emerging constructs. What emerged from the grounded theory of the narratives collected during the early parts of this study was a series of propositions surrounding the way in which individuals evaluated choice and the subjective nature through which the individual evaluated different choices. Specifically, what emerged from the first 13 narratives were references to individual "value systems" that were at play and appeared to be used to direct action. However, despite the many references to values (both direct e.g., "I valued X" and coded through researcher interpretation "It was more important to me that we did Y") this alone was insufficient to develop a series of axial and theoretical codes because, alone, the role of values had not reached the level of theoretical saturation (Glaser & Strauss, 1967). Saturation is defined as "data adequacy," and was operationalized here to mean that no new theoretically relevant information was being obtained (Morse, 1995)

Given this, a process of theoretical sampling to further explore the role of value systems as they pertain to the process of choice in military decisions was adopted.

Theoretical sampling is the process by which the collected data dictate the direction of future data collection, in accordance with the theory being developed. Theoretical sampling involves making decisions about the collection of further data based on the analytical insights derived from the data that has been collected at that time (Strauss, 1987, pp. 16–21, 274–279). Theoretical sampling is a pivotal strategy in grounded theory methodology as it ensures that theories are based on a full exploration of the categories involved (Charmaz, 2000; Strauss, 1987). As Glaser (1978) outlines, theoretical sampling is the process in which, "the analyst jointly collects, codes, and analyzes his [or her] data and decides what data to collect next and where to find them, to develop his theory as it emerges" (p. 36). Theoretical sampling occurs once the researcher begins to develop an idea of what is occurring. This then leads to redirecting the methodology to collect more detailed data on a given category or aspect of their area of study. As Strauss (1987) highlights, theoretical sampling "involves … much calculation and imagination on the part of the analysts … " (p. 39).

For the theoretical sampling, the same CDM method and structure, outlined above, was used. The only alteration in the 14 additional interviews was that during the third sweep (deepening) a series of probes were included that specifically sought to identify the underlying value systems at play during the decision. If relevant, the underlying origins of these values were also discussed.

## Data analysis

As proposed originally by Glaser and Strauss (1967), grounded theory involves constant comparative analysis and consists of "explicit coding and analytic procedures" (p. 102). This, they advise, should be conducted by following four procedural steps of data analysis:

1. comparing incidents applicable to each category,
2. integrating categories and their properties,
3. delimiting the theory, and
4. writing the theory (p. 105).

In constructing the categories and theory, grounded theory relies on three central elements; concepts, categories, and propositions. Concepts are the basic unit of analysis (like "codes" in thematic analysis). Coding in grounded theory is the process of both labelling concepts and categorizing them into groups of similar phenomena (Strauss & Corbin, 1990). Coding, then, is the "pivotal link between collecting data and developing an emergent theory to explain these data" within which the researcher finds

meaning within the data and a theory begins to emerge (Charmaz, 2006, p. 46). In their first outline of grounded theory, Glaser and Strauss (1967) studied the interactions of nurses with dying patients. One "code" that emerged was "social loss," in that nurses tended to think about the death of a patient in terms of the social impact that would have (i.e., who will they leave behind and what effect will their death have on them; p. 106). By constantly comparing instances of this "code" (social loss), the authors were able to develop a theory of how social loss affects patient care, i.e., that "some patients are perceived as high social loss and others as low social loss, and that patient care tends to vary positively with the degree of social loss" (p. 106; see also Kelle, 2007, p. 194).

With the evolution of grounded theory, several different forms of coding have been proposed (most notably the split in methods between the founders of grounded theory; Strauss and Glaser). Glaser (1978) suggests that there are two stages of coding, one "substantive" and the other "theoretical". Strauss & Corbin (1990) suggested three stages of coding: open, axial and selective. Charmaz (2006) has since also proposed three stages of coding: initial, focused, and theoretical. What all models, arguably, reflect is a gradual increase in coding specificity from *a priori* open coding of the material through to attempts to discern the theoretical relationship between the codes.

This study adopted the epistemological stance of Strauss and Corbin (1994). While both the framework developed by Strauss and Corbin (1990) and Glaser (1992) adhere to the same basic research process; gather data, code, compare, categorize, theoretically sample, develop a core category and generate a theory (see Walker & Myrick, 2006), these different approaches make different assumptions about the data and how the research processes is carried out. The rationale for our adoption of the epistemological framework of Strauss and Corbin (1994), over that of Glaser (1992), is that while both support the importance of avoiding mechanistic interpretation, Strauss and Corbin adhere to a more formal and prescriptive routine for analysing qualitative data (Locke, 1996). Their approach also involves a more pragmatic and general process model that we found attractive for our Soldier[1] sample (Kelle, 2007). Given that this type of data has not been collected, explored, nor analysed before, we decided to adopt the more prescriptive model of grounded theory (see Suddaby, 2006).

In Corbin and Strauss' coding model, open coding is "the interpretive process by which data are broken down analytically" (Strauss & Corbin, 1990, p. 12) and the "analytical process through which concepts are

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[1]In this paper, we use the capitalized version of the word Soldier in accordance with Army Chief of Staff General Peter J. Schoomaker who ordered that the word "soldier" is capitalized in all contexts, as if it were a proper noun.

identified and their properties and dimensions are discovered" (p. 101).[2] At the same time, for each code identified the researcher must also identify the dimensions of that code (i.e., its upper and lower limits) as well as whether that code relates to a phenomenon, causal factor, context, intervening condition, action/interaction strategy, or consequence (Strauss & Corbin, 1990; see also Kelle, 2007; Walker & Myrick, 2006). Theoretical sensitivity (i.e., being able to correctly interpret the data is achieved through a series of techniques including constant questioning, analysis of words, phrases and sentences, as well as both considering the code "close-in" and "far-out" (i.e., at the micro and macro level; see Strauss & Corbin, 1990; 1998)). The second stage of coding, axial coding, explores the relationship amongst codes and, involves putting the data back together in new ways that "by making connections between a category and it's subcategory" (p. 97). Here, the researcher seeks to understand the relationships between categories and sub-categories by creating relationships between them from the categories and codes (Strauss and Corbin, 1997). The final stage then is selective coding in which the researcher integrates and refines the theory (Strauss & Corbin, 1990, p. 143). In order to achieve this, the researcher selects a core category and relates all other categories back to this (and to each other). Thus, selective coding is related to axial coding (in that it involves the inter-relation of categories), but this is done at a far more abstract level (i.e., relating to emergent properties of the data, rather than categories identified within the data; Strauss & Corbin, 1990).

To put this method in perspective with an example, in the current study a participant made the following utterance

> So, if you have a car-bomb that goes off in close proximity, or there is someone that blows a building up and it goes crashing down, uh, then as a commander I have responsibility to find all the personnel, find all the sensitive items, get everything back out of there.

There are many potential codes of interest here (sensitive items, retrieval of materials, close proximity). But, focusing on "responsibility," in open coding we identify the relevant code, as well as its dimensions (i.e., personal responsibility can increase and decrease between people, and between situations). Based on this code (and other instances of this code being mentioned), through a process of questioning, and using other analytical tools, we may develop a category of "responsibility" that encompasses several subcategories (e.g., types of responsibility). For axial coding, using the theoretical paradigm we examine the conditions or situations in which responsibility occurs, the reactions and actions of those affected by responsibility

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[2]To see the differences between the processes undertaken here, and those advocated by Glaser (1992), we encourage the reader to visit Walker and Myrick (2006) for a full discussion and comparison.

(and how it changes between them), and the consequences of these actions (Strauss & Corbin, 1998). This demonstrates that responsibility affects decision-making depending on what type of responsibility is felt. In the final stage (selective coding) we factor responsibility into our final theory. For example, we may identify that what the person is responsible for (people vs., property) and how important that responsibility is to them (this links other potential categories) affects whether or not the individual will decide, and what decision they might make.

## Results and discussion

### A grounded theory of choice in least-worst decisions

Through grounded theory analysis of military narratives, and theoretical sampling around value systems, we identified an early theory of how Soldiers, under conditions of goal conflict, are able to commit to choices that have potentially intolerable outcomes. Specifically, we identified the core category of values as central to understanding the inter-relation between the categories identified in this research. Specifically, what emerged was that Soldiers consistently demonstrated a strong degree of attribute differentiation between different values (meaning that they often had a strong and clear goal hierarchy of values). When making least-worst decisions, they often would not make a sacrifice on a single prominent 'sacred' value that they deemed non-negotiable. What this means is that while the importance of the values (at the start of the process, overall, or when viewed by others) may have been equal (meaning they would be in conflict), Soldiers were able to draw a dissociation between the two choices, allowing a decision to be made.

One category central to the theory developed here (but there are exceptions, as stated below) was that Soldiers often refused to make any sacrifices regarding the safety of the men and women under their command. For example, when deciding if and how to recover a large military asset currently burning in a local village, one interviewee highlights the importance of force protection:

> I think um If I was to prioritize [*my goals*], it would be to protect the lives of *U.S.* Armed Forces, I don't want to be skittish and afraid to do our mission, but I certainly didn't want to waste lives, or put them unduly at risk. We had spent a lot of money to mitigate risk and injury and death, and this was about recovering a piece of equipment, and I put that below Soldier safety. If I would have known the outcome of that would have been the death of 2 Soldiers, I would have said it was not worth it.

On the reverse side, his decision-making would have been completely different had there been military personnel at risk:

If I had personnel out there with it. I mean to say that the truck that they were hauling on was you know, say there was some personnel trapped out there. And then those are the times when you know you have to go, and you put people at risk to go, and we've been through that a lot of times when people get hit by an IED and there are folks trapped in the vehicle and then you just go, you don't think about it, you don't feel like you have a choice to just leave people out there.

His decision-making, therefore, flips on a single sacred value. In a similar vein, another participant highlights the importance of force protection when deciding how to proceed with the convoy:

Of course, protection is number one, make sure everyone gets back in one piece, hence we have a lot better chance in the firefight. I guess everyone in the country has control, and we have a squad that has more fire power than one of the most fire powered squads in the military so the special forces or what …. our job is personal security detail, we are there to make sure an officer made it back and that was our primary objective, everything else was secondary.

A Captain from the U.S. Army shared a similar sentiment:

I mean the idea is the way I saw it, and the, it is, you know, I, uh, before every deployment I talk with parents and, you know, my mission is to do my best to bring every one of their sons' home.

As one interviewee highlighted; the need to protect all your Soldiers stays even though it often clashes with more mission-focused objectives.

You don't want your squadron commander to yell at you. So, you don't want that. So, I mean that was of course in the back of my mind, you don't want to fail your mission and then again you don't want to lose all of [*vehicles*] so that was a stressor. So, you didn't want to fail your mission … certainly didn't want to lose a Soldier

Thus, despite the many values in military decision-making (protecting the population, protecting forces, achieving the mission), a Marine interviewee sums it up best when, while pursuing a high-ranking member of Al-Qa'ida in Iraq, he maintains that force protection was his number one priority:

Targeting this insurgent was an incredible, great, opportunity, we have never had an opportunity like this before to get some bad guys that have put up a fight. But my goals were; (1) Protection of own force; (2) Killing bad guys; (3) Protecting population.

The importance placed on looking after your fellow Soldiers is unsurprising: it is commonly known to any lay person that this strong social bond between Soldiers is a vital protective factor with the stressors placed upon them during war. In Leonard Wong and colleagues' (2003) study on how Soldiers were motivated to "continue in battle, to face extreme danger, and

to risk their lives in accomplishing the mission" they found that "U.S. Soldiers', much like Soldiers of the past, fight for each other." Thus, today's Soldier is like their WWII counterparts, for whom, as S. L. A. Marshall (1947) noted in *Men Against Fire*, "I hold it to be one of the simplest truths that the thing which enables an infantry Soldier to keep going with his weapons is the near presence or presumed presence of a comrade … he is sustained by his fellows primarily." He continued, "men do not fight for a cause but because they do not want to let their comrades down." What this implies is the psychological coping benefits of protecting one's troops; such a strong group-tie has psychological consequences for how Soldiers can handle conflict and navigate least-worst decisions.

Here then, this theory centres not on the evaluation of multiple attributes (as with multi-attribute decision-making), but with all options being evaluated on a single value to which complete priority is given. However, what separates this theory from the theoretical regression of single-attribute decision-making is the source of the value itself. What emerged from our data, was that in military decision-making, the single value used to evaluate all options was an intrinsically held value that was deemed important *to them*. To put this point in perspective we provide the full outline of the decision, and value-tradeoff below:

> I'm sitting there getting everybody consolidated, reorganized, and distributing ammo because we didn't know if there was gonna be another attack or what was going on and we had the civil affairs major came up to me and he said 'I want you to pursue the enemy'. 'I want you to go up into the mountains and get a body count pursue the enemy.' and I looked at him and I said 'are you kidding me?' And of course we were all standing around the top of this little hill mountain that we were on where this medical clinic was no bigger than this room right now and we were in the middle and everybody was kinda around getting stuff ready and you know … I said 'we're not gonna do that. We're gonna consolidate and reorganize, we're gonna distribute ammo and we're gonna get the hell out of here. We still have to make it out of this canyon. They let us in but it doesn't mean that they're gonna let us out. And frankly we don't have the force to pursue the enemy.' I mean at the time we didn't know how big they were, we didn't get the intel reports and stuff back until later, but it was clear that they were outnumbered and damn near overrun but for the close air support. And he said 'Captain I'm not asking you I'm giving you an order you will go into the mountains and get a body count and pursue the enemy …. Talk about paralysis by analysis, there was no paralysis here. For a split second I thought 'this is it, this is my military career' … and I said 'well Sir here's what's gonna happen; the people that are wearing this patch [pointing at his own arm] – which was everybody there expect for the civil affairs team which were probably 6 guys – I said everybody that is wearing this patch is gonna get in their vehicles and we're gonna get the fuck out of here because this is not a safe place to be. And the people wearing that patch [*pointing at the civil affairs Major's arm*] can stay here and follow you

into the mountains. And at which point he got right in my face, very irate. the guy had a temper problem. He was just extremely irate you know swearing at me telling me that I was disobeying a direct order and he was gonna bring me up on charges and I just looked at him and said 'well you do what you have to do Sir and I'll do what I have to do.' And I looked over to my Platoon Leader and I said 'mount up let's get the fuck out of here' and everybody got in their vehicles including the Major who was umm the civil affairs major and we rolled out of there.

Now, this clearly presents a least-worst decision; the officer had two choices; obey what he thought was a risky and dangerous order or disobey an order and potentially end his military career. Yet, with relative ease, he decides and commits to a very high-risk course of action with a negative outcome. In his own words;

> My decision-making process there took about 30 seconds. Long enough for me to think … literally I disobey this order I'm taking my 10-year career and throwing it in the garbage. But again, this was a split-second decision for me because at the end of the day I remember thinking to myself I would rather lose my commission, you know, be fired and find another job and have everybody there that was with me make it back home than you know make the wrong decision and follow an order that I knew was tactically unsound and lose my Soldiers and/or my life. So, I don't think that process took very long I guess long enough for me to kind of kinda have that conversation in my mind.

Values are types of beliefs that guide us towards value-congruent behavior (Bardi & Schwartz, 2003; Schwartz, 2005). For example, if the value of honesty is important to us, we are more likely to act honestly when the opportunity arises. At the same time, acting dishonestly (a value-incongruent behavior) will be more difficult. Values, therefore, affect the tradeoffs we are and are not willing to make in decision-making (Kruglanski & Stroebe, 2005; Rokeach, 1973). Values impact decision-making and increase decision difficulty when there is value-conflict. In contrast they can facilitate decision-making where they are absolute insofar as they increase clarity – sacred, non-negotiable values are precluded from being traded-off or traded against (Hanselmann & Tanner, 2008). Inviolable values are called "sacred values" (e.g., Tetlock, Kristel, Elson, Green, & Lerner, 2000). Sacred values are defined as "any value that a moral community implicitly or explicitly treats as possessing infinite or transcendental significance that precludes comparisons, tradeoffs, or indeed any other mingling with bounded or secular values" (Tetlock et al., 2000, p. 853). Baron and Spranca (1997) referred to such values as "protected," in that each protected value is "infinitely more important than others" (p. 2) and attempting to tradeoff against such values can elicit strong emotional reactions such as denial, blame, procrastination, and avoidance (Anderson, 2003; Fiske & Tetlock,

**Table 2.** CDM probes used to explore participants' decision-making strategies with a special emphasis on value systems (*italics represent questions inserted during theoretical deepening*).

| Topic | Cues |
|---|---|
| Information | What were you hearing/thinking/noticing during this situation? |
| | What information did you use in making a decision or judgment? |
| | How and where did you get this information, and from whom? |
| | What did you do with this information? |
| | Did you discard any information that you received? |
| Analogs | Did this situation remind you of any previous experiences you have had? |
| Standard operating procedures | What were the parallels you drew between the situation and others? |
| | Did this case fit a standard scenario? |
| | Is this the type of event you were trained to deal with? |
| Goals and priorities | What were your specific goals and objectives at this time? |
| | What was the most important thing for you to accomplish at this point? |
| *Value systems* | *What values were you rely on when making these decisions?* |
| | *Which of these values were you willing to sacrifice against?* |
| | *Why, to you, is this value so important?* |
| Options | What other courses of action were considered? |
| | What courses of action were not considered, and why? |
| | Was there a rule that you were following in choosing this option? |
| Experience | What specific training or experience was necessary or helpful in making this decision? |
| Assessment | If you were asked to describe the situation to someone else at that point, how would you describe it? |
| Mental models | Did you imagine the possible consequences of this/these action(s)? |
| | Did you create some sort of picture in your head? |
| | Did you imagine the events and how they would unfold? |
| | How close was your imagined outcome to the actual outcome? |
| Decision-making | What let you know that this was the right thing to do at this point in the incident? |
| | How much time pressure was involved in making this decision? |
| | Did you think about it for too long? |
| | Were you ever worried about the time it was taking to make the decision? |
| | How long did it take to actually make this decision? |
| Guidance | Did you seek any guidance at this (or any) point in the decision? |
| | How did you know to trust the guidance you got? |
| Feelings | How did making this decision-make you feel? |
| | How did you feel about potentially making the wrong choice? |

1997). Non-sacred values, referred to as secular, while important (often from an organizational standpoint) do not have the same inviolability.

Using the theory of value systems that emerged from our analysis, we can hypothesize why this incredibly tough decision was, for this individual, so easy to make. The Soldier demonstrates the sacred value of force protection over the more secular value of obeying orders to superior commanders and is able, in an extreme and high-consequence situation, to decide and avoid RD. On the other hand, if he held the value of "obeying orders" or "pursuing the enemy" in the same regard as protecting his forces then it is

viable to propose that he would have found this decision harder and, potentially, engaged in redundant deliberation between which of the two values is more important. However, and as evidenced by his actions, to this Soldier the importance of protecting the lives of his Soldiers was too sacred.

In grounded theory, pre-existing theories can emerge from the data, they just cannot be used to create or interpret the data as it is collected (they must emerge from it). As stated by Strauss and Corbin (1994) existing theories, if "they seem appropriate to the area of investigation, then these may be elaborated and modified as incoming data are meticulously played against them" (Strauss & Corbin, 1994, p. 273). Hence, the theory that emerges from this data is not a "new" theory per se, but instead is the application of an extant theory of decision-making which is yet to be applied to military decision-making, but matches the data presented here and organically arose from it (rather than being deductively applied to it). Specifically, this theory of least-worst decision-making centres on the core category of values (specifically if the value is viewed as "sacred" or "secular") as the predictor of how a decision will be made, if it will be made, and how difficult the individual will find that decision to make.

The presence of sacred and secular values in decision-making leads to three distinct types of value tradeoff (Tetlock et al., 2000) that can all predict decision-making. Incorporating the case presented above (decision to follow orders or not), the first form of tradeoff is *a routine tradeoff*[3] in which two secular values are pitted against each other. Here, if the individual does not hold values of "protecting forces" and "obeying orders" as particularly sacred, this choice will be moderately difficult because there is no clear reason to pick one option over the other. The second type of tradeoff is the *taboo tradeoff,* in which a secular value is traded off against a sacred value. In this case, the individual held "protecting my forces" as a sacred value. In this instance, this sacred value is traded-off against the more secular value (obeying orders) resulting in a difficult, but quick and consistent decision to disobey the order. Similarly, if the values were reversed, the outcome would also be reversed (pursuing enemies). The final type is a *tragic tradeoff*. In the example above, if *both* protecting forces and obeying orders was sacred to the individual the least-worst decision is a tragic tradeoff because it required the individual to trade two sacred values that ordinarily would both receive absolute priority. In this instance redundant deliberation is likely to emerge. Cases within our data demonstrated that when two

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[3]It is worth mentioning that the authors have a general distain for the term "routine," "toxic," and "taboo" tradeoffs in the context of high-risk, and especially military, decisions. However, given that they are established terms within the field, and given the complexity of the analyses to come, we shall continue to use these terms to reference no sacred values; one sacred value and more than one sacred value.

**Table 3.** Sacred and secular values and least-worst decision-making.

| | | Option B | |
| --- | --- | --- | --- |
| | | Secular value | Sacred value |
| Option A | Secular value | Routine tradeoff: RD due to the inability to decide between two opposing secular values (e.g., organizational policies) | Taboo tradeoff: Absence of RD due to a sacred value (e.g., force protection) which cannot be traded against |
| | Sacred value | Taboo tradeoff: Absence of RD due to a sacred value (e.g., force protection) which cannot be traded against | Toxic tradeoff: RD and extreme difficulty in committing to a choice due to tradeoff between equal sacred values which decision-maker is not willing to trade-off against |

colliding sacred values were involved, an individual would engage in 'looping' cognitions and redundant deliberation and, as stated in the introduction, be unable to commit to a least-worst course of action.

> That was all uncertainty on my part, I felt like that might be a threat, but I wasn't sure enough if it was, right. On the one side, you know I've got a deadly weapon and intent, I just don't have the know-how, I just don't know whether I should be firing or not. And so, I guess some part of me is worried about killing him, and about escalating a situation that was non-hostile. And so, that was probably a larger factor in my mind and, um, I'm thinking I don't want to screw this up, and so I'm really going to pay attention to what they are doing, and um, I think if they had been, you know, he was drawn on the guy and I was drawn on the guy he was ready to fire and I was ready to fire. If, um, we had heard, if a round had gone off I would have been firing immediately, no question about it, if you know the driver had shot or my guys had shot I would have fired without hesitation, but I didn't know, I wasn't sure if I was supposed to fire

We can present the relationship between values and decision-making in a simple table (and we acknowledge the over-simplicity of this representation) in which options A and B can be either sacred or secular (in line with Tetlock, 2003; see Table 3). To complete Table 3, we have added observations of the likelihood that redundant deliberation will emerge in these instances, and the ability of the decision-maker to make fast and effective decisions.

## Methodological limitations: post-hoc "bolstering"

While we acknowledge that a strength of the CDM method is that decisions can be explored *post-hoc*, rather than *in situ*, this also poses important

methodological limitations given that there are known accuracy issues when reporting retrospectively (Ericsson & Simon, 1980). Given the known issues with human introspection around decision-making (Nisbett & Wilson, 1977) it is important the reflect on the potential limitations of this method and the data presented here. Janis and Mann's (1977) model of decisional conflict argues that when making a decision that involves (potential) unfavourable outcomes, decision-makers often "bolster" the perceived benefit of one choice while minimizing the costs of the other. Bolstering involves magnifying the attractiveness of a chosen outcome, while playing down the potential losses (Festinger, 1964). Bolstering can also involve diminishing the likely losses from options that were turned down. Bolstering is therefore a dissonance-reducing activity that changes the decision-makers subjective evaluation of the chosen and unchosen actions, rating the chosen action as more attractive and the unchosen action less so. As such, the decision maker effectively spreads the alternatives increasing the differentiation of options to a greater degree than they are in reality (Janis & Mann, 1977, p. 82). This "spreading of alternatives" has been shown in both experimental and field studies; showing that after someone has committed to an action they are likely to bias their perception in a way that maintains the spread between alternatives (e.g., Brehm & Cohen, 1962). What this means is that when asking participants to recall a situation in which they specifically had to choose between alternatives that were equally averse, because they made a choice, they are likely (and to varying degrees) to perhaps bolster their positive perception of the choice that they made and minimize the potential losses that could have occurred from the choices that they did not make. This is an important point to consider given that bolstering has been shown to occur in decisions such as car purchasing, yet here our CDM is focused on decisions that are high-risk, averse, and whose outcomes involve the life, and death, of themselves, fellow Soldiers and members of the civilian populations. Given the high-stakes of such decisions (coupled with the high-costs of errors) it is viable to propose that post-decisional bolstering could be a vital defense mechanism against dissonance and regret. Given the clear methodological constraints of gaining access to members of the military and emergency services *in extremis* this point puts precedent on efforts of psychologists to increasingly use experimental methodologies to examine least-worst decision-making in order to remove the opportunity for post-hoc bolstering and provide a clearer picture of the decision-making strategies that occur during a least-worst decision.

## Conclusion

Previous naturalistic work has found that when faced with tradeoffs, decision-making often stalls and the decision-maker struggles to commit to a

choice. However, some individuals are better able to handle conflict and are often less vulnerable to decision inertia. Our data here supports the view that this resistance may lie in their stronger value hierarchy. Specifically, we argue that, in many cases, sacred values often drive decision-making under conditions of conflict because individuals refuse to tradeoff against this. These assertions, if proven correct, offer important implications for the role of understanding values and value systems both theoretically for decision-making, but also in applied realms of training and selection. Yet, this is but a theory, and it is imperative that future work (our own included) focusses on further exploring the role of values, and further unpicking and then specifically testing the degree to which they predict when inertia emerges, why, and with whom. What is especially important is that future research (qualitative and quantitative) test the hypotheses that stem from this theory. Specifically, that; (1) when individuals face decisions that involve one sacred value they will make decisions faster and report lower decision difficulty (2) When individuals face decisions that involve two or more sacred values they will make decisions slower and report higher decision difficulty. While there is some preliminary support for these assertions (Duc, Hanselmann, Boesiger, & Tanner, 2013; Hanselmann & Tanner, 2008), similar methods should be applied here with least-worst decisions.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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