The Effect of Combat Exposure on Soldiers' Ethical Attitudes: Preliminary Model and Mitigation Strategy

by

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Disclaimer

The opinions expressed in this document reflect the opinion of the author and do not necessarily represent the official position of the Canadian Forces or the Department of National Defence.

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Abstract

Most studies on the psychological impact of military operations have focused on mental health outcomes and protective factors. Notwithstanding the importance of mental health, other dimensions of military operations stand to benefit from additional research. One area deserving much greater attention is battlefield ethics. Given the detrimental effects that an ethical lapse may have on the success of an entire operation, it is critical that this process be better understood. To this end, two studies were conducted. A total of 1,382 Canadian soldiers participated in Study 1. Each participant completed a measure of combat exposure, psychological distress, and ethical attitudes. The results showed that combat exposure and ethical attitudes are related, but this relationship was fully mediated by psychological distress. Study 2 attempted to replicate Study 1 results in a completely different sample (N = 819) and to explore whether a positive social/unit climate could attenuate the detrimental effects of combat exposure on personnel well-being and ethical attitudes. The results showed a direct effect of combat exposure on ethical attitudes, and although no moderation effects were detected, positive social/unit climate perceptions were found to have a direct beneficial effect on mental health. Implications for practice and research are discussed along with limitations to the validity and generalizability of the findings.

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Background

War zones are among the most hazardous work environments (Farley & Catano, 2006). Since the beginning of Operation Iraqi Freedom, over 4,400 U.S. troops have been killed and close to 32,000 have been seriously injured (U.S. Department of Defense, 2011). Additionally, in a recent article on the intensity of combat and behavioural health status of U.S. soldiers serving in Iraq, Castro and McGurk (2007a) noted that more than three quarters of the 1,124 troops surveyed by members of a Mental Health Advisory Team (MHAT) had been in situations where they could have been seriously injured or killed. Statistics relative to the number of deaths and casualties sustained by Canadian troops during their 10-year combat mission in Afghanistan (April 2002 to December 2011) are no more positive. According to official records (National Defence, 2012), among the 40,000 Canadians who served on this mission, 158 have been killed and over 2,000 have been wounded. Given the risks incurred by soldiers, most studies on the psychological aspects of military deployments have focused on mental health outcomes and protective factors such as training, cohesion, family support, and leadership (readers wishing a comprehensive summary of this literature are referred to Hosek, Kavanah, & Miller, 2006). The heavy emphasis that clinicians and researchers have traditionally placed on these issues is easily noticeable simply by looking at the list of topics covered in a few recent books on military psychology (e.g., Britt & Adler, 2003; Britt, Adler, & Castro, 2006; Kennedy & Zillmer, 2006).

Problem Statement

Notwithstanding the importance of mental health, other psychological dimensions of military operations stand to benefit from additional research. One research area that deserves much greater attention is battlefield ethics, a field of study dealing with ethical decision-making and behaviour during combat operations. Indeed, this topic has gained significant interest within the past few years in tandem with the occurrence of various war zone scandals (e.g., the abuse and torture of Iraqi detainees by members of the U.S. Military Police, the slaughter of innocent Afghan civilians by members of a U.S. Army "kill team", the shooting of a wounded and unarmed insurgent by a Canadian Army officer). Yet, apart from three U.S. military studies concerning the links between combat exposure, mental health, and self-reporting of battlefield ethics violations, there have been no empirical studies in this area (see MHAT IV, 2006; MHAT V, 2008; Warner et al., 2011).

The Current Research

Given this situation, and the absence of consensus concerning the process through which combat exposure could possibly affect ethical attitudes and behaviours, two complementary studies were conducted. Study 1 built upon previous work by assessing whether combat exposure and ethical attitudes are related, and by testing whether this relationship is mediated by symptoms of distress. Study 2, then, sought to determine whether a social climate characterized by high morale, good leadership, strong cohesion, and a shared ethos can attenuate the possible effects of combat exposure on ethical attitudes and well-being.

Significance

Together, these studies fill an important gap in our understanding of the psychological mechanisms that can turn normal, ordinary soldiers into perpetrators of malevolent or unethical combat behaviour. Until now, much of what we knew about this process was based on a relatively small subset of experiments and theories (e.g., Bandura, 1999; Haney, Banks, & Zimbardo, 1973; Milgram, 1963, 1964) summarized in Philip Zimbardo's (2007) latest book called *The Lucifer Effect: Understanding How Good People Turn Evil*. While insightful, these scholarly sources paint an incomplete picture of the host of factors that can influence ethical decision-making and behaviours during combat operations. Indeed, because they focused their attention on the influence of harmful social dynamics (e.g., deindividuation/anonymity, dehumanization, moral disengagement, deviant group norms, and blind obedience to authority) rather than on the influence of the operating environment, the idea that some deployment experiences may be morally toxic for soldiers has not yet been considered nor discussed.

Literature Review

Recent studies conducted in Iraq and Afghanistan among members of the U.S. military paint a worrisome picture of the ethical challenges that today's soldiers are facing (see MHAT IV and MHAT V reports). For example, they show that nearly half of surveyed personnel had been in threatening situations where they had to choose between obeying orders (i.e., following the rules of engagement) and protecting their own lives. They also show that nearly one third of research participants had faced ethical situations during deployment in which they did not know how to respond. These kinds of dilemmas (or potentially stressful situations) are reminiscent of the role conflict and role ambiguity concepts of the occupational stress literature, which have shown to be associated with physical and psychological symptoms of strain as well as with job satisfaction, organizational commitment, involvement, propensity to leave, and job performance (Jackson & Schuler, 1985; Nixon, Mazzola, Bauer, Krueger, & Spector, 2011).

Paradoxically, though, apart from a few recent studies (e.g., Olsen, Pallesen, & Eid, 2010; Verweij, Hofhuis, & Soeters, 2007), little research has been done into the cognitive process that military personnel follow when confronted with an ethical dilemma (Weber & Gerde, 2011). A major objective of the present dissertation is to partly fill this gap by assessing whether combat exposure affects ethical attitudes, a documented determinant of ethical intentions and behaviours (e.g., Dubinsky & Loken, 1989; Montesarchio, 2009). In the first part of this literature review, the broad theoretical context underlying the proposed studies is presented. The process through which attitudes can influence ethical decision-making is discussed next, followed by a review of relevant

research and theories on attitude formation. Finally, research on protective factors is discussed and the rationale for studying the role of social climate perceptions instead of specific climate dimensions (e.g., leadership climate) is explained.

Ethical Decision-Making

Most studies in the area of ethical decision-making have been influenced by the work of James Rest. For that reason, his four-component model of ethical decision-making provides an appropriate starting point to situate the contribution that other scientists have made to our understanding of the cognitive process through which people make ethical or unethical decisions. In Rest's (1986) model, the ethical decision-making process begins when one becomes aware that an issue has ethical implications. An issue has ethical implications when one's decision or behaviour can harm or benefit someone else (Jones, 1991). Once an ethical issue has been detected, the next step in the process is to form an ethical judgment, that is, to evaluate the ethical merits of various courses of action. Once a morally acceptable course of action has been identified, one must form an ethical intent to act on that judgment. The concept of ethical intent is functionally equivalent to the concept of intention in Ajzen's (1991) theory of planned behaviour – an observation I will return to later. Finally, the last step in the process is to engage in the chosen behaviour.

Much like Kohlberg (1969), Rest believed that a person's ability to evaluate the ethical merits of an act or decision was primarily determined by his or her level of moral development. According to Kohlberg's (1969) theory of moral development, peoples' ability to engage in ethical judgment is regulated by their level of cognitive moral

development. At the low end of the developmental spectrum (*the pre-conventional levels*), people's judgment is primarily influenced by their selfish need to avoid punishment or obtain rewards. At the next developmental levels (*the conventional levels*), individuals judge the morality of an action on the basis of its consistence with accepted standards of behaviour (e.g., the law, corporate rules, etc.). They tend to follow rules even if there are no consequences for obedience or disobedience. Finally, at the high ends of the developmental spectrum (*the post-conventional levels*), people's judgment is primarily influenced by their idiosyncratic beliefs about right human conduct; they might not follow rules if they are inconsistent with their own moral values.

Unlike Rest, however, Trevino (1986) argued that knowing about one's level of moral development is not enough to predict behaviours. Instead, she offered a competing model, whereby individual factors (including ego strength, field dependence, and locus of control) and situational factors (including immediate job context, organizational culture, and characteristics of the work) interact with one's moral judgment to determine how a person is likely to behave in response to an ethical issue. The notion that individual and situational factors can interact with one's judgment to influence behaviours is common to many ethical decision-making frameworks. For example, in Ferrell and Gresham's (1985) contingency framework for understanding ethical decision-making in marketing, individual factors (including knowledge, values, attitudes, and intentions) and organizational factors (including significant others and opportunity factors) are posited to interact with one's ethical judgment to influence decision-making. In a subsequent theory of personal ethics in marketing, Hunt and Vitell (1986) proposed that environmental

factors (stemming from the cultural environment, the industry sector, and the organization) and personal experiences affect not only the cognitive component of the process, but also the perception that an ethical issue is present.

Jones (1991) took the previous ethical decision-making models one step further by arguing that each step of the decision-making process is also influenced by the moral intensity of the issue. Jones identified six dimensions of an ethical issue that collectively determine its moral intensity. The first dimension is termed *magnitude of consequences*, and denotes the aggregate harm or benefit that a proposed behaviour could yield. The second dimension is termed *social consensus*, and is defined as the degree of social agreement that a proposed behaviour is morally right or wrong. The third dimension, *probability of effect*, refers to the likelihood that a proposed behaviour will actually take place and yield the anticipated outcomes (either good or bad). The fourth dimension is *temporal immediacy*, and refers to the time lag between a moral decision and its aftermath. The fifth component, *proximity*, refers to the social, cultural, psychological, or physical distance between the moral agent and the victims (or beneficiaries) of his or her decision. Finally, the sixth dimension is termed *concentration of effect*, and is an "inverse function of the number of people affected by an act of a given magnitude" (p. 377).

As shown, each of the foregoing models has made a unique contribution to our understanding of the cognitive process through which people make ethical (or unethical) decisions. Paradoxically, though, despite all the quantitative studies demonstrating the influence of attitudes on behaviours (Ajzen & Fishbein, 1977), none did more than hint that one's attitudes could also affect the decision-making process. In fact, when Ferrell

and his colleague briefly alluded to the influence of attitudes, it was in relation with the judgment component of the ethical decision-making process and they did not elaborate on the issue (Ferrell & Gresham, 1985). Accordingly, in the two studies reported here, nearly all the emphasis is placed on attitudes, specifically those relative to battlefield issues (or behaviours) of comparatively high moral intensity (e.g., torture of detainees, reporting of battlefield ethics violations).

Ethical Decision-Making and Attitudes

The study of attitudes occupies an important place in both social and organizational psychology. The concept of attitude refers to "summary evaluations of objects [e.g., things, people, and behaviours] along a continuum ranging from positive to negative" (Petty, Wegener, & Fabrigar, 1997, p. 611). The utility of attitudes stems from their ability to predict behaviour, specifically under conditions of high correspondence between at least the target and action elements of the attitudinal and behavioural entities (Ajzen & Fishbein, 1977). To visualize the role that attitudes can play in the prediction of ethical (or unethical) behaviours, it is useful to consider Ajzen's (1991) theory of planned behaviour where the central component -intention- is functionally equivalent to the moral intent concept in Jones' (1991) ethical decision-making framework (Figure 1). One key assertion of this theory is that the best predictors of what a person will do in a choice situation is provided by a measure of the individual's intention to act (or not to act). In other words, the stronger the intention to engage in behaviours of any kind, the more likely should be their performance (Ajzen, 1991). The intention to act, in turn, is held to be determined by three interrelated factors. The first is the *attitudes toward the behaviour*,

which as discussed earlier, refers to summary evaluations of the behaviour along a continuum ranging from positive to negative. The second is a social influence factor termed *subjective norms*, which refers to "the perceived social pressure to perform or not to perform the behaviour" (Ajzen, 1991, p. 188). The third is *perceived behavioural control* and refers to "the perceived ease or difficulty of performing the behaviour and it is assumed to reflect past experience as well as anticipated impediments and obstacles" (Ajzen, 1991, p. 188).

The theory of planned behaviour has received considerable attention in the social psychological literature, and a meta-analysis over 185 independent studies has shown that its components account for 27% and 39% of the variance in behaviour and intention, respectively (Armitage & Conner, 2001). Additionally, studies that were not included in this meta-analysis support the validity of the theory for predicting moral/ethical intentions regarding academic dishonesty (e.g., Harding, Mayhew, Finelli, & Carpenter, 2007) and digital piracy (e.g., Yoon, 2011). In most studies included in Armitage and Conner's (2001) meta-analysis, the single best predictor of behavioural intentions is one's attitude towards the behaviour. According to Fishbein & Ajzen's (1975) expectancy-value model of attitudes, behavioural attitudes are formed by linking each behaviour to its anticipated consequences. Since the consequences that come to be associated with the behaviour are already appraised favorably or unfavorably, we automatically acquire an attitude toward the behaviour.

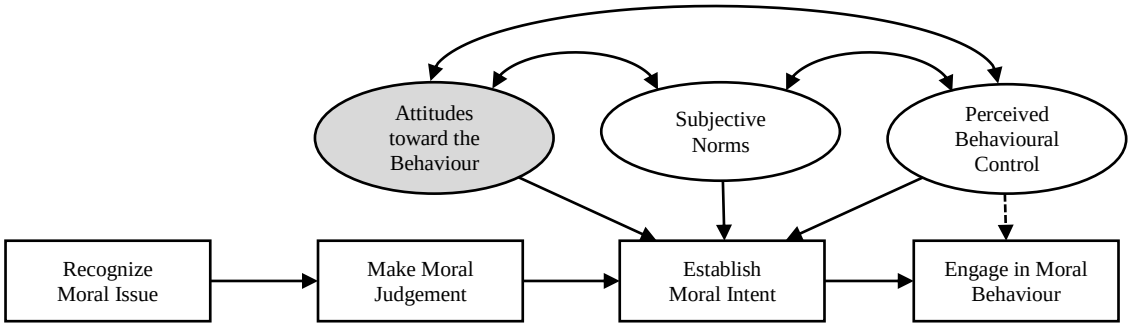

Figure 1. Integrated model of ethical decision-making where the theory of planned behaviour is juxtaposed with core elements of Jones' (1991) ethical decision-making framework

It also appears that another source of attitudinal influence is our direct and indirect experience with the target of the behaviour (Fazio & Zanna, 1978). These experiences shape our liking (or disliking) of those behavioural targets, which can, in turn, influence our behaviours towards them. It is well established, for instance, that mere repeated exposure to a range of attitude objects is sufficient to increase our liking (Bornstein, 1989), which in the case of intergroup contact, can reduce biases and discrimination (Pettigrew & Tropp, 2006). However, it has also been demonstrated that this mere exposure effect may be reversed in contexts of intergroup threat (Crisp, Hutter, & Young, 2009). In these circumstances, repeated exposure leads to less liking, which can, in turn, result in inter-group conflicts and aggression (Fiske, 2006). A recent study conducted among Dutch soldiers provides a concrete example of this phenomenon. In the weeks preceding their deployment on a high-risk mission in southern Afghanistan, participants were asked to indicate their endorsement with five statements concerning the local population in their designated area of deployment (e.g., *I think that the local population is*

generally peaceful). These same five statements were presented again during deployment along with a series of questions relative to realistic threat perceptions (e.g., *During this mission I have been exposed to truly life-threatening situations*). Results showed significant differences between deployment conditions in evaluation of the local population (i.e., participants reported more negative evaluations of the local population during the mission than before their deployment), and greater threat perceptions during the mission were found to be associated with stronger declines in soldiers' attitudes towards local Afghans (Van den Berg, Dechesne, Soeters, & Duel, 2009).

A third source of influence on a person's attitude towards behaviour is his or her mood state when evaluating the behaviour (or its target). Affect infusion into judgments is a well-documented phenomenon defined as "the process whereby affectively loaded information exert an influence on and becomes incorporated into the judgmental process, entering the judge's deliberations and eventually coloring the judgmental outcome" (Forgas, 1995, p. 39). However, the magnitude of affect infusion into judgments varies across situations, and theories such as the *affect infusion model* have been elaborated to delineate the conditions that intensify or attenuate the effect of moods on cognitions (Forgas, 2002). One central tenet of this theory is that the magnitude of mood effects on judgments is exacerbated in unfamiliar, complex situations that call for elaborate reasoning (Forgas, 1995). This is generally the case when a person is confronted with a moral issue (Green & Haidt, 2002; Haidt, 2002), and since combat operations present many ethical challenges, they are possibly fertile grounds for mood effects on ethical attitudes and judgment. One other kind of situation where affect infusion into judgments

is high is when a person responsible for computing a judgment or an attitude has little time and capacity to engage in elaborate processing before producing a response (Forgas, Cooper, & Crano, 2010). This is often the case during survey administration where people must indicate their agreement (or disagreement) with a series of statements about a broad variety of subjects in a relatively short period of time. In these circumstances, people may simply rely on how they feel about the issue, and in so doing, misattribute feelings due to a pre-existing state to an attitude target.

The Influence of Combat Exposure on Ethical Attitudes

CF personnel deployed to Afghanistan have been exposed to high levels of violence and its aftermath. A recent study on the deployment experience of 3,034 CF members revealed that 64.7% of personnel surveyed reported receiving indirect fire (i.e., incoming artillery, rocket, or mortar fire), and that 41.5% reported having members of their own unit become a casualty (Ivey, Blanc, Therrien, & McCuaig-Edge, 2009). Additionally, 44.2% reported being attacked or ambushed, 40.4% reported having hostile reactions from local civilians, and 16.5% reported handling or uncovering human remains (Ivey et al., 2009).

It is well established that these kinds of experiences can lead to a range of problems from temporary adjustment difficulties to long-lasting mental health problems such as post-traumatic stress disorder (PTSD; Adler, Castro, & Britt, 2006). Clinicians and researchers are also starting to realize that certain combat experiences (perhaps even combat exposure in general) can be morally injurious. For instance, two recent MHAT reports involving U.S. soldiers demonstrate that certain combat experiences (i.e., having a

member of one's own unit become a casualty and handling human remains) are related to self-reporting of unethical combat behaviours including insulting or cursing non-combatants in their presence, damaging Iraqi property when it was not necessary, and physically hitting or kicking a non-combatant when it was not necessary (Castro & McGurk, 2007b; MHAT V, 2008). In addition, the reports show relationships between mental health (positive screening for PTSD or depression) and self-reporting of unethical combat behaviours (MHAT IV, 2006; MHAT V, 2008).

These findings together with past reports of an association between killing, self-reports of military atrocities, and mental health problems (e.g., Beckham, Feldman, & Kirby, 1998; Breslau & Davis, 1987; Fontana & Rosenheck, 1999; King, King, Gudanowski, & Vreven, 1995; and MacNair, 2002) have spawned the development of a new concept termed *moral injury*. For the group of mental health specialists who initially coined the expression, the term moral injury refers to a state of grave suffering characterized by PTSD-like symptoms and haunting feelings of inner conflict (e.g., feelings of shame, guilt, or anxiety relative to the consequences of one's own behavioural choices) arising from perpetrating, failing to prevent, witnessing, or learning about acts that are at odds with one's deeply held beliefs about right human conduct and expectations about how people should be treated (Litz et al., 2009). Collateral manifestations of moral injury may include an array of self-harming, self-handicapping, and risk-taking behaviours, but these behaviours, and the regressive (or maladaptive) moral cognitions that may accompany them, are thought to arise from a failure to deal with the primary feelings and symptoms of distress.

With regards to symptomatology, the moral injury framework proposed by Litz et al. differs from PTSD in two important ways. First, unlike PTSD, there is no threshold for establishing the presence of moral injury (Maguen and Litz, 2012). The perspective is therefore less clinical and more in line with the tenets of occupational health psychology−and with the concept of perpetration-induced traumatic stress (see MacNair, 2002, for details)−where those who have symptoms that do not rise to the level of a disorder are still of interest. Second, contrary to PTSD, there is no requirement that the injurious experience be associated with fear, helplessness, or horror. Instead, it is feelings of shame and/or guilt that are thought to give rise to the problem.

In a more recent article, in which Litz is also an author, the conceptual demarcation between moral injury and PTSD is made even more salient. In that document, the term moral injury refers first and foremost to:

> a disruption in an individual's confidence and expectations about one's own or others' motivation or capacity to behave in a just and ethical manner… [arising from] bearing witness to perceived immoral acts, failure to stop such actions, or perpetration of immoral acts, in particular actions that are inhumane, cruel, depraved, or violent, bringing about pain, suffering, or death of others (Dresher et al., 2009, p. 9).

Thus, there seems to be some disagreement about how much emphasis should be placed on the "moral aspects" (ethical attitudes and ethical intent) of the moral injury concept. In the first article (Litz et al., 2009), Litz and her associates argue that negative changes in ethical dispositions are one of many possible complications arising from one's failure to

cope with the other symptoms, notably feelings of guilt, shame, and anxiety. In Dresher's article, these changes in ethical dispositions seem to be a central feature of the syndrome, not simply a late-occurring, collateral manifestation of the injury. As for the source of potential moral injury, both groups are of the opinion that they are generally brought about by perceived immoral acts on the battlefield. However, they also acknowledge that these kinds of experiences are arguably not the only source of potential moral injury; hence the decision to focus on general combat exposure and not solely on morally questionable or ethically ambiguous experiences.

Social Climate at Work (Moderator)

Military studies have shown that psychological reactions to combat are also influenced by social and interpersonal factors within units (Gifford, 2006). For instance, qualitative research conducted in the aftermath of World War II attributed the remarkable resilience of German land forces (also known as the Wehrmacht) to the strong cohesion within their ranks (e.g., Shils & Janowitz, 1948). Since then, empirical studies conducted in civilian and military settings have repeatedly demonstrated the importance of morale, cohesion, and leadership in reducing the psychological impact of stress on personnel (Hosek, Kavanagh, & Miller, 2006; Siebold, 2006). What has yet to be determined, however, is whether a general (or high order) perceptual factor of *social climate* at work can attenuate the possible impact of combat exposure on the well-being and ethical attitudes of soldiers, and, as discussed later in Study 2, whether the strength of this "buffering" effect varies as a function of rank, years of service, and operational experience.

The idea that a general social climate factor shaped by daily interactions and shared experiences among members of small primary workgroups could influence the well-being of individual soldiers, but also their ethical attitudes stems from studies relative work climate (e.g., Parker et al., 2003). In these studies, the term climate refers to "summary perceptions or summated meaning that people attach to particular features of the work setting" (Ostroff, Kinicki, & Tamkins, 2003, p. 575). One frequently cited framework to classify these features is that of James (see James & James, 1989). This model postulates the existence of a general factor of psychological climate shared by four comparatively narrow climate dimensions including job characteristics, role characteristics, leader behaviours, and workgroup characteristics. Despite the empirical evidence supporting the existence of this general factor, growing disenchantment with the ability of broad bandwidth measures of climate to predict specific work outcomes (e.g., safety behaviours) has led many researchers to start linking specific climate dimensions (e.g., safety climate) to specific referents, for instance safety behaviours (e.g., Zohar, 2000). However, a recent meta-analysis of over 50 empirical studies has demonstrated that "individuals interested in predicting broader individual level outcomes (e.g., performance and withdrawal) can also be well served by a taxonomy of more molar [or less specific] climate perceptions" (Carr, Schmidt, Ford, & DeShon, 2003, p. 612).

Thus, given the broad focus of the present dissertation (i.e., the study of factors influencing both well-being and ethical attitudes), it seems that conceptualizing and measuring social climate as a broad bandwidth construct characterized by an amalgam of individual perceptions relative to leader behaviour and workgroup characteristics is more

appropriate here than focusing on the role of narrow bandwidth factors such as leadership climate, morale, and cohesion (cf. Hogan & Roberts, 1996; Schneider, Hough, & Dunnette, 1996). From a theoretical perspective, this global or summary perception of the workgroup and its leader provides a psychological context in which military personnel experience operational stressors, and it is this context that has tremendous potential to moderate the impact of operational stress by shaping how they interpret and react to events. A possible mechanism for this moderator effect is that social climate perceptions, by influencing affective commitment (Carr et al., 2003), might create an environment or a situation in which people are more (or less) inclined to seek and accept social support−a determinant of psychological adjustment (Inness & Barling, 2006)−and to adhere to organizational values despite the potentially adverse influence of morally questionable experiences.

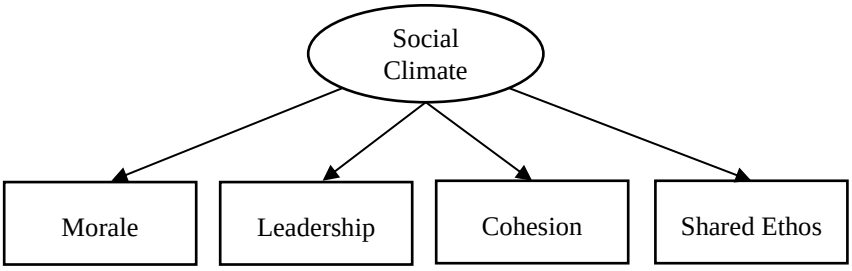

Figure 2. Proposed structure of social climate perceptions in military settings.

Figure 2 presents a proposed structure of social climate perceptions in military settings. The choice of climate variables, specifically leadership, cohesion, and morale was influenced by the emphasis that social and military psychologists have historically placed on these dimensions (e.g., Bliese, 2006; Futterman, Orlandi, & Schinke, 1991) as well as by their documented influence on well-being and work attitudes (e.g., Bliese &

Castro, 2003; Inness & Barling, 2006). As for the inclusion of shared ethos−herein defined as individual perceptions that unit values are consistent with those of the larger organization−among the group of climate variables, this decision was made on the basis of data showing the impact of value congruency on cohesion and organizational behaviours (e.g., Boxx, Odom, & Dunn, 1991).

Though the study of organizational values and norms is typically regarded to be within the purview of culture research, it is argued here that a social climate is only "positive"−in the sense of providing a context for the strengthening of ethical attitudes and the attainment of organizationally sanctioned goals−when the values embraced by the referent work unit are perceived to be congruent with those of the larger organization. This way of thinking about social climate is reminiscent of, and consistent with, Shay's (2009) writings on cohesion, which he described as "a phenomenon of nature that is neither intrinsically good nor bad. It's like electricity−if it bakes your bread, it's great; if it electrocutes your daughter, it's terrible" (p. 289). This point of view is further supported by a social-anthropological study demonstrating that the breakdown in discipline that culminated in the killing of a Somali teenager by members of the late Canadian Airborne Regiment was partly caused by the erosion of traditional military values in a unit where strong interpersonal ties were coupled with a misplaced loyalty (see Winslow, 1998, for further details).

However, in order to maintain the conceptual demarcation between social climate and organizational culture−herein defined as an organizational attribute representing the consensus about the norms, values, and behavioural expectations within a given work unit

(James et al., 2008; Schein, 1990)−, I propose that workgroup values be examined from an individual perspective rather than from a systemic (or aggregate) perspective. Also, to clearly delineate the concept of shared ethos from that of individual values−herein defined as "desirable transsituational goals, varying in importance, that serve as guiding principles in the life of a person [emphasis added]…" (Schwartz, 1994, p. 21), I propose that the focus be placed on individual perceptions of workgroup values rather than on personal values per se. This is not to say, obviously, that personal values are unimportant for the formation of ethical attitudes. Indeed, numerous studies have shown that the values underlying Schwartz' self-enhancement and conservatism value dimensions, for instance, security, power, and achievement, have an influence on support for manifestations of intergroup inequality and domination (see Lehmiller & Schmitt, 2008, for a review).

Summary

Most quantitative studies on the psychological costs of military operations have focused on mental health outcomes such as PTSD and/or were conducted several years after the end of hostilities (e.g., Maguen et al, 2009; Maguen et al., 2010a; Maguen et al., 2010b). The present dissertation differs from and improves upon these studies by looking at other potential adverse effects of combat that may not be labelled as combat stress reactions (i.e., changes in ethical attitudes) and, as discussed later, by looking at soldiers' reactions while they are still on deployment. In addition, unlike previous research that looked at the stress-buffering role of specific climate dimensions such as leadership, morale, or cohesion (e.g., Farley & Veitch, 2003), this dissertation operationalizes social

climate as a broad bandwidth construct, and evaluates its possible "shielding" role on more than just well-being, but also on soldiers' ethical attitudes. Finally, the idea to conduct a series of exploratory analyses to assess whether the possible influence of social climate perceptions varies as a function of career stage is another unique aspect of this dissertation.

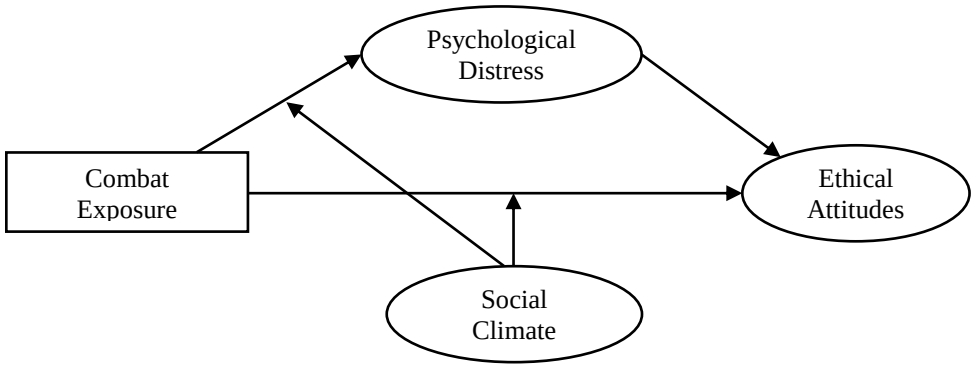

Figure 3. Conceptual framework

In the conceptual framework depicted in Figure 3, the variable labelled combat exposure represents the overall frequency to which participants have been exposed to various combat stressors (e.g., being attacked or ambushed). Unlike the other elements in the model, which are represented as latent variables, this element is operationalized as a single observed variable representing the sum of several combat-related items. The decision to operationalize this construct as a single observed (or manifest) variable instead of a latent construct stems from the realization that the frequency with which soldiers are exposed to different kinds of combat stressors cannot be attributed to the influence of an "unmeasured" factor (see Jarvis, MacKenzie, & Podsakoff, 2003, for further details on this issue), and that representing combat exposure as a *composite variable* with multiple formative indicators−where the direction of the effect is from

measure to construct−would result in statistical problems (e.g., multicollinearity among indicators, cases-per-parameter ratio below acceptable threshold) for which no simple remedies exist (see MacCallum & Browne, 1993, for a detailed review of the problems associated with the use of formative indicators).

The two paths leading to psychological distress and to ethical attitudes represent the possible effect that combat exposure might have on these variables. The path from psychological distress to ethical attitudes represents the possible effect that the former variable might have on the outcome variable, namely ethical attitudes. As for the other two paths in the framework (i.e., those pointing towards the mid-section of two other paths), they represent the hypothesis that a positive (or negative) social climate can attenuate (or exacerbate) the possible effect of combat exposure on wellbeing and ethical attitudes.

General Procedure

The two studies are based on survey data collected by the CF to monitor factors that can adversely affect (or improve) individual and organizational performance on deployment. Data collection was approved by the CF's Social Science Research Review Board (see Appendix A for ethics review application and proof of approval). Surveys were administered to two large groups of CF personnel (i.e., members of Task Force 3-09 and 1-10; Operation Athena Phase II[1]) about halfway through their six to seven month deployment in Kandahar Province, Afghanistan. All available personnel were given an

[1] Operation Athena Phase II was a counterinsurgency operation focused on Kandahar Province in southern Afghanistan. The operation started in August 2005 and ended in July 2011. The role of Canadian troops was to fight the Taliban insurgency, to support the development and growth of Afghanistan's governmental institutions (especially its national security forces), and to assist with the repair of damaged infrastructures.

opportunity to complete the survey, and those who agreed to participate did so by completing either the electronic or paper-and-pencil versions of the survey. Although survey administration was conducted by the chain of command through personnel officers, participation was voluntary and the anonymity of respondents was protected. The complete survey instructions can be found in Appendix B.

Study 1

A number of key points emanate from the Literature Review. *First*, it was established that the process through which people make ethical decisions is commonly regarded as involving several steps culminating in the formulation of an intention to act morally (see Trevino, Weaver, & Reynolds, 2006, for a complete review). *Second*, it was shown that there is a large body of literature attesting that our behavioural intentions are partly influenced by our attitudes towards the behaviour, and that these attitudes are shaped by the anticipated consequences of that act, our past experiences with the target of the behaviour, and our general mood state (or feelings) when evaluating the behaviour or its target. *Third*, it was discussed that high levels of combat exposure can affect our mood and elicit feelings and emotions that can result in either (or both) mental health problems and/or faulty ethical reasoning and behaviours (see Farley & Catano, 2006, for examples). However, it was also highlighted that it is not yet clear whether these mental health problems always precede faulty ethical reasoning and behaviour, or if the feelings of anxiety, resentment, or apprehension people experience when they perceive that another group is in a position to inflict them harm are sufficient to weaken the cognitive and affective barriers that prevent military personnel from engaging in unethical/unlawful combat behaviours. Indeed, as discussed earlier, some clinicians and researchers think that combat stress injuries such as PTSD can lead to misconduct behaviours (e.g., Litz et al., 2009; Shay, 2009), whereas other experts think that one needs not to be experiencing clinical symptoms of distress to be "morally injured" in combat and to engage in

behaviours that fall outside the realm of what is normally permitted under the Geneva Conventions (e.g., Warner et al., 2011).

The idea that combat exposure can be "morally toxic" for soldiers is consistent with theory and research on intergroup conflicts, notably with intergroup threat theory (see Stephan, Ybarra, & Morrison, 2009, for details on this theory). According to this theory, humans are fundamentally “tribal” in nature, and because of the personal needs that membership in “tribal” social groups fulfill, they are predisposed to react with hostility when their social group is perceived as being threatened. Two types of threats are considered: symbolic threats and realistic threats. Realistic threats−which are arguably the most apparent sources of threat in the context of combat operations−refer to the perception that members of another social-group threaten the wellbeing of one’s own group. In contrast to realistic threats, symbolic threats refer to perceptions that the outgroup challenge the ingroup’s values and beliefs relative to politics, morality, and religion. The theory further states that strong ingroup identification−which is commonly the case among members of organized armed groups−and a lack of personal experience with the outgroup can increase the salience of threats, which can in turn lead to cognitive biases and negative feelings (e.g., frustration, anger, hostility) that make violence against the outgroup more likely and easier to condone. Thus, in light of this theory, it makes sense to think that a high level of combat exposure could directly lead to unethical battlefield attitudes and extreme hostility.

As a structural model, Figure 4 depicts a series of pathways through which combat exposure could theoretically influence ethical attitudes. The *direct effect hypothesis*

(represented by a direct path between combat exposure and ethical attitudes) is consistent with the gist of intergroup threat theory (Stephan et al., 2009), as well as with research on the reversed mere exposure effect (see Crisp, Hutter, & Young, 2009), and with Dresher's operationalization of the moral injury concept (Dresher et al., 2011). As for the *indirect effect hypothesis* (represented by the paths from combat exposure to psychological distress and from psychological distress to ethical attitudes), it is consistent with central tenets of Forgas' (1996) affect infusion model, and with Litz' definition of the moral injury concept (Litz et al., 2009). Hence, because there is some theoretical and clinical support for both representations, no prediction was made as to which of them, if any, would best fit the data. However, consistent with the ideas that organizational culture is learned (Schein, 1990) and that one's understanding of an organization is a function of tenure (Taormina, 1997), it was hypothesized that rank and years of service would be positively related to ethical attitudes. Additionally, based on military research showing that prior combat deployment experience is associated with poorer adjustment to a subsequent combat deployment (McCarroll, Fagan, Hermsen, & Ursano, 1997; Wolfe, Erickson, Sharkansky, King, & King, 1999), it was hypothesized that number of UN/NATO tours would be positively related to psychological distress.

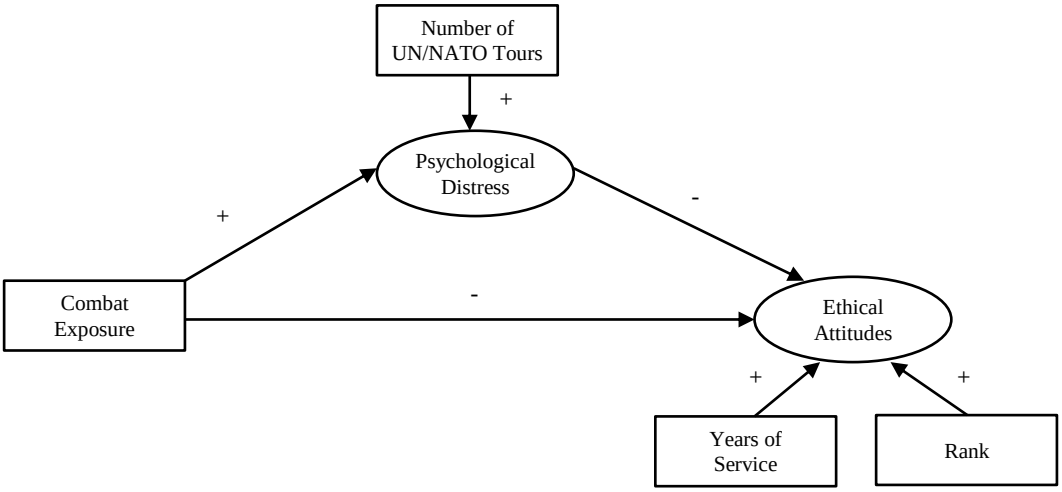

Figure 4. Structural model integrating both the direct and indirect effect hypotheses. Correlations between exogenous variables are not represented in the model to reduce its complexity and facilitate reading.

Method

Data. The data for this study were provided by the Director General Military Personnel Research and Analysis. The original data file contained the survey responses of 1,563 CF personnel that completed the in-theatre version of the Human Dimensions of Operations (HDO) survey during the period from 15 February to 15 March, 2010[2]. However, upon inspection of the raw data, 170 cases were deleted. Of those 170 cases, 113 had completed the French version of the HDO survey, 40 had skipped 20% or more of the survey questions, and 17 cases had provided internally inconsistent data (e.g., reported being senior officers with 5 years of military service or less). Upon removal of these cases, the amount and distribution of missing values was examined. It was found that: (a) the nominal and ordinal variables from the background information section of the

[2] This corresponds to a 47% response rate.

survey had the greatest percentage of cases with missing values (up to 8.8%), whereas the quantitative (scale) variables had very few cases with missing values (no more than 1.1%); (b) that the data were likely missing at random, and (c) that the most common pattern of non-responding was to skip many background information questions, presumably to protect one's own identity. Given these findings, the dataset was split into two parts, a calibration and a validation sample, and missing values were imputed through multiple-imputations using the Missing Value Analysis add-on package for SPSS 19.0[3]. This step resulted in the creation of 10 complete datasets–five for each sample. Then, using the diagnostic tests implemented in AMOS 18.0, each complete dataset was screened for the violation of important statistical assumptions. This resulted in the additional removal of 11 multivariate outliers (four from the calibration sample and seven from the validation sample) as well as in the decision to use bootstrapping to handle the non-normal distribution of the data[4]. No problems related to multicollinearity and singularity were detected. Table 1 presents the background characteristics of each sample. Compared to official data (see Appendix C), it seems that the distribution of ranks corresponds to that of the larger population from which the two samples were drawn, but that members of headquarters and maneuver units were respectively under- and over-represented by approximately ten percent.

[3] This method for handling missing values is an extension of regression-based single imputation where missing values are estimated using information from other variables in the dataset. The difference between these two imputation strategies is that with the former, multiple versions of the original dataset are created by adding a random number (drawn randomly from the distribution of residuals associated with the previous prediction) to each new regression equation. This procedure yields different plausible versions of how the data might look like in the population. Combining the statistics computed using each multiply-imputed dataset (e.g., by averaging parameter estimates) reduces error and produces estimates that are typically more accurate than those that are based on single imputation (see Wayman, 2003, for further details on the computation of multiply imputed datasets).

[4] No transformations were made as the data was not expected to be normally distributed in the population.

Table 1

Characteristics of the Calibration and Validation Samples for Study 1

		Calibration Sample (n = 693)		Validation Sample (n = 689)	
		Count[a]	Valid[b] %	Count[a]	Valid[b] %
Rank	Junior NCM	424	67.3	422	66.7
	Senior NCM	113	17.9	106	16.7
	Junior officers	69	11.0	69	10.9
	Senior officers	24	3.8	36	5.7
Home situation	Married	165	26.1	159	24.8
	Married with dependents	178	28.2	194	30.3
	Single	261	41.4	250	39.0
	Single with dependents	27	4.3	38	5.9
Component	Regular (Full-time)	555	84.9	555	85.4
	Reserve (Part-time)	99	15.1	95	14.6
Years of service	5 or less	239	37.3	228	35.5
	6 to 10	167	26.1	171	26.6
	11 to 15	94	14.7	82	12.8
	16 to 20	55	8.6	55	8.6
	21 to 25	52	8.1	70	10.9
	26 or more	33	5.2	36	5.6
Number of tours	1	350	54.0	346	53.6
	2	124	19.1	121	18.7
	3	87	13.4	68	10.5
	4	42	6.5	57	8.8
	5 or more	45	6.9	54	8.4
Unit type	Headquarters	24	3.6	33	4.9
	Manoeuvre	433	64.4	411	60.8
	Support/sustainment	210	31.3	226	33.4
	Other	5	0.7	6	0.9

Note. NCM = Non-commissioned member; married includes common-law; single includes divorced, widowed, and separated; and dependents include children and elderly parents. [a]Numbers may not add up to 693 or 689 because of missing data. [b]Percentages may not add up to 100 because of rounding.

Measures.

Combat exposure. Level of combat exposure was evaluated by summing participants' responses to the first 34 items of the Stress on Operations scale (Appendix

D), a slightly adapted version of the Combat Exposure Scale (CES) developed by the Walter Reid Army Institute of Research (Castro & McGurk, 2007a). The Stress on Operations scale presents a list of combat situations that may cause soldiers to experience stress[5]. For each of these situations, two answers are required. First, participants must indicate the frequency of which they have experienced any of these situations while on their current deployment. Responses are recorded on a 5-point scale ranging from 1 (*Never*) to 5 (*Ten or more times*). Next, using a different scale, they must indicate how much trouble or concern each of these situations have caused them. Here, only the frequency ratings were analysed. This decision stemmed from the realization that the impact ratings could have more than one meaning. For instance, they could be interpreted as a measure of stress or, alternatively, as a measure of the extent to which participants have been morally disturbed by any of these situations. Frequency ratings on the original CES have been linked to elevated risks for mental health problems (Castro & McGurk, 2007a), but also to risk-related behaviours such as more frequent and greater quantity of alcohol use, and increased verbal and physical aggression towards others (Killgore et al., 2008).

Psychological distress. Symptoms of distress were measured with the Kessler Psychological Distress Scale (K10). The K10 (labeled Signs of Stress in Appendix E) is a short self-report questionnaire designed to measure the severity level of anxiety and depressive symptoms in the past month (Kessler et al., 2002). Items were developed and selected using methods of item response theory to reliably detect non-specific mental

[5] The full scale contains a total of 44 items, but it's only the first 34 questions that have been borrowed and adapted from the CES. The other 10 questions (i.e., items 35 to 44) were developed by the HDO research team, and no information has ever been published on the psychometric properties of these items.

disorders in population surveys. In the original version of the scale, respondents rate each item from 1 (*All of the time*) to 5 (*None of the time*) to indicate the degree to which they have been bothered by a particular symptom over the past four weeks. In the present study, the rating scale was reversed to make it more consistent with the rest of the HDO survey. No further modifications were made to the original questionnaire. A review of the literature that focuses on the psychometric properties of the K10 suggest that it is a valid (AUC typically ranging from .80 to .94) and reliable (Cronbach's Alphas typically ranging from .82 to .94) assessment tool that can be used in a variety of settings and cultures to reliably screen for general and specific forms of anxiety and mood disorders (Fassaert et al., 2009; Furukama et al., 2008; Oakley Browne, Wells, Scott, & McGee, 2010; Patel et al., 2008).

Ethical attitudes. Ethical attitudes were evaluated using the Moral Climate scale of the HDO Survey (Appendix F). This scale comprises twelve statements concerning ethical and unethical combat behaviours. Respondents must indicate their level of agreement (or disagreement) with each statement. Answers are recorded on a 5-point scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Four of the twelve statements were adapted from the Soldier and Marine Well-Being Survey (MHAT IV, 2006). The rest were developed by the HDO research team in collaboration with subject matter experts (SMEs) from the Canadian Army Headquarters. No information has ever been published on the psychometric properties of these statements. On the surface, however, they seem to address three areas: (a) attitudes towards treatment of detainees and non-combatants (items 1, 2, 3, 5, 7, 8, and 12), (b) attitudes towards reporting of

ethical violations (items 9 and 10), and (c) willingness to take risks to minimize harm done to civilians (items 4, 6, 11).

***Background information*.** The background information questionnaire was composed of 11 questions designed to capture relevant demographic variables (e.g., rank, first official language, home situation, years of service, number of operational deployments, etc.). A copy of this questionnaire is available in Appendix G.

Statistical analyses. As indicated previously, the decision to impute missing values through multiple-imputations resulted in the creation of 10 complete datasets–five for each sample. The statistical analyses described below were thus performed on each dataset separately and combined for each sample using an Excel calculator implementing Rubin's (1987) formulas for combining the outputs of multiply imputed datasets. The main advantage of handling missing data through multiple-imputation is that instead of filling in a single value for each missing data point it replaces each missing value with a set of plausible values that represent the uncertainty about the right value to impute. Therefore, even though the analysis of multiply imputed datasets is more laborious than the analysis of a single dataset, the former has the advantage of yielding results that more accurately reflect the uncertainty due to missing values[6].

[6] There are, of course, alternative strategies to deal with missing data. However, these strategies have important limitations, rendering their use much less attractive in the circumstances. For instance, even though listwise deletion and pairwise deletion are commonly used and comparatively easy to implement, their use can lead to a loss of power, which was an issue here because small effects were expected. Also, even though AMOS can deal with missing data through full-information maximum likelihood estimation, this strategy is incompatible with bootstrapping, which created another problem here because some variables are skewed and the use of bootstrapping was regarded as a better strategy to deal with this problem than either reflection or logarithmic transformation. Readers wishing a comprehensive review and evaluation of strategies to deal with missing data are referred to Switzer and Roth (2002) for details.

Given that the Moral Climate (ethical attitudes) scale had never been subjected to psychometric evaluation, the first analysis consisted of conducting an exploratory factor analysis (EFA) of this instrument. The optimum number of common factors was determined through an examination of the scree plot of eigenvalues from the reduced correlation matrix as well as from the computation of RMSEA fit indices (with 90% CI) for progressively more complex factorial structures. Once this number was established, factor extraction and interpretation was conducted using maximum likelihood estimation with direct quartimin rotation. This factor extraction technique was selected because it conforms to the common factor model and allows the computation of model fit indices, specifically chi-square (χ^2) test statistics and RMSEA-values. The direct quartimin rotation was selected because oblique rotations provide estimates of the correlations among common factors (Fabrigar, Wegner, MacCallum, & Strahan, 1999). Items with loadings below .32 were deleted one at a time and the factor analysis process was repeated until all items met the minimum loading threshold (Tabachnick & Fidell, 2001).

Once the factor structure of the Moral Climate (ethical attitudes) scale was established, items were grouped into parcels, and parcel scores were computed by summing responses to related survey questions. Although item parcelling is not always advisable (e.g., when the primary goal of a study is to understand the structure of set of items), numerous researchers have highlighted the psychometric merits of parcels relative to items (see Little, Cunningham, Shahar, & Widaman, 2002, for a review). Following this step, the means, standard deviations, and intercorrelations among measured variables

were calculated[7]. Next, the measurement model underlying the structural model depicted in Figure 4 was specified and the extent to which it fit the data was evaluated. Given all measures were obtained using the same method (survey questions), the possible inflation (or deflation) effect of common method variance (see Meade, Watson, & Kroustalis, 2007; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) was estimated by loading all indicators of substantive constructs onto an "unmeasured" method factor and computing a chi-square difference ($\chi^2\Delta$) tests to evaluate whether a model that takes common method variance into account (i.e., one where these paths are free, but constrained equal) provides a significantly better fit to the data than a model where no method effect exists (i.e., one where these paths are fixed to zero). This approach to method effect evaluation has been used in a number of studies (e.g., Carlson & Kacmar, 2000; Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995; Elangovan & Xie, 1999; Podsakoff, MackKenzie, Moorman, & Fetter, 1990), and is particularly well suited for situations where: (a) the predictor and criterion variables cannot be obtained from different sources, (b) when the predictor and criterion variables cannot be measured in different contexts, and (c) when the source of the method bias cannot be identified (Podsakoff et al., 2003).

Upon evaluating the fit of the measurement model, estimation of composite reliability−symbolized α_{CRCM}−for each latent variable in the model (i.e., psychological distress and ethical attitudes) was performed through structural equation modeling (SEM) using a method based on classical test theory (see Raykov, 1997, for details). This

[7] Readers wishing to see descriptive statistics concerning the rate of exposure to the potentially stressful situations listed on the Stress on Operations scale and the rate of endorsement to the statements listed on the Moral Climate (ethical attitudes) scale are referred to Appendix H.

technique can be used to estimate the reliability of any congeneric measure[8], and the reliability estimates it yields do not possess the general underestimation bias of Cronbach's alpha (see Rae, 2008, for a discussion of this issue in relation with tests composed of item parcels). Readers wishing to see how this estimation technique has been implemented in past studies are referred to Thurber and Bonynge (2011) for an example.

Next, the structural model illustrating the process through which combat exposure could theoretically influence ethical attitudes was evaluated through SEM using 1000 bootstrap samples and the Maximum Likelihood discrepancy function implemented in AMOS 18.0. The main advantage of using SEM (specifically latent variable path analysis) over conventional multiple regression analyses (e.g., Baron & Kenny, 1986) is that the former corrects latent variables for measurement error; allows simultaneous estimation of direct, indirect, and total effects; and facilitates comparison of hypothesized models with competing models (Judge, Hurst, & Simon, 2009). In this study, three competing structural models were evaluated: (a) a partially mediated model as shown in panel A, (b) a fully mediated model as represented in panel B, and (c) a nonmediated model as illustrated in panel C (Figure 5). Given that the fully mediated model and nonmediated model are nested within the partially mediated model, a series of chi-square difference ($\chi^2\Delta$) tests were computed to identify which of the three competing models, if any, would best fit the data (Kelloway, 1998).

[8] Congeneric measures (or tests) are comprised of heterogeneous sub-dimensions that may or may not be measured using the same scale of measurement and that may or may not have the same level of precision (Raykov, 1997).

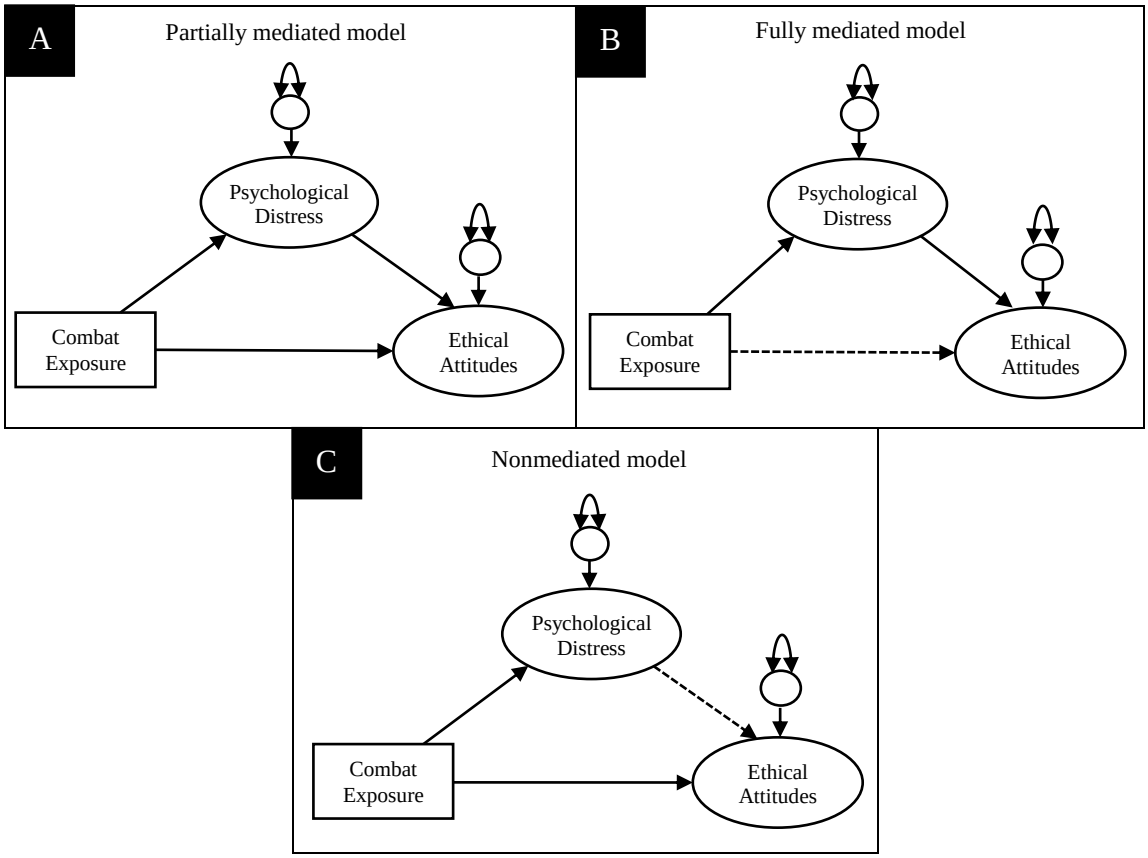

Figure 5. Competing structural models (without control variables) for Study 1. Dashed lines represent paths that are constrained to zero.

A model fits the data when the covariance matrix implied by the model is consistent with the observed covariance matrix. The adequacy of the fit is typically assessed using absolute fit indices (e.g., χ^2 test statistic, RMSEA, PCLOSE), comparative fit indices (CFI and TLI), and parsimonious fit indices (e.g., PNFI and AIC). A model fits reasonably well when its χ^2 statistics is non-significant (or in large samples when its χ^2/df ratio is smaller than 5), its RMSEA-value is lower than .08, its PCLOSE is greater than .05, and by convention, when its comparative fit indices are greater than .90 (Tabachnick

& Fidell, 2001). However, because there are no standards for how high PNFI and AIC values should be to indicate parsimonious fit, these fit indices are best used to compare two competing models (Kelloway, 1998). In these circumstance, the model with the smaller AIC and PNFI values is regarded as superior.

Finally, because there is always a risk that the results of SEM analyses could be driven by chance or by characteristics of the sample on which the covariance structure model was tested, the model that provided the best fit in the calibration sample was used as a "baseline" model in the validation sample and evidence of multigroup equivalence was evaluated sequentially though a series of $\chi^2\Delta$ tests (Byrne, 2010). The first step in this kind of multi-group analysis consists of testing the goodness-of-fit of the baseline model–that is, the extent to which the full structural equation model is invariant across groups–for both samples simultaneously. This yields a χ^2 value that serves as a baseline referent against which all subsequent models are compared. Next, the invariance of the measurement model is evaluated by constraining all measurement weights to be equal across groups. The difference in the χ^2 statistics between this model and the baseline model is a test of the null hypothesis that the factor loadings are invariant across groups. If the χ^2statistics is significant, the next step is to identify the measurement weight(s) that are not operating equally across the calibration and validation samples. This process is accomplished by testing the invariance of factor loadings relative to each subscale separately. Once a final model is established–and the noninvariant loadings have been freed–the process is repeated for each subsequent model to be tested, that is, for each components of the full structural equation model including the structural weights and the

structural covariances. Although the measurement and structural residuals are also part of the full structural equation model, testing for their invariance is uncommon and considered to be excessively stringent (Byrne, 2010).

Results

Exploratory factor analysis. A factor analysis of the Ethical Attitudes scale was expected to yield a three-factor solution corresponding to the three topic areas that the scale seems to address, namely (a) attitudes towards treatment of detainees and non-combatants, (b) attitudes towards reporting of ethical violations, and (c) willingness to take risks to minimize harm done to civilians. Contrary to expectation, an examination of the scree plot of eigenvalues from the reduced correlation matrix suggested (based on the number of factors corresponding to the last sudden drop in the graph) the presence of one underlying factor (Figure 6).

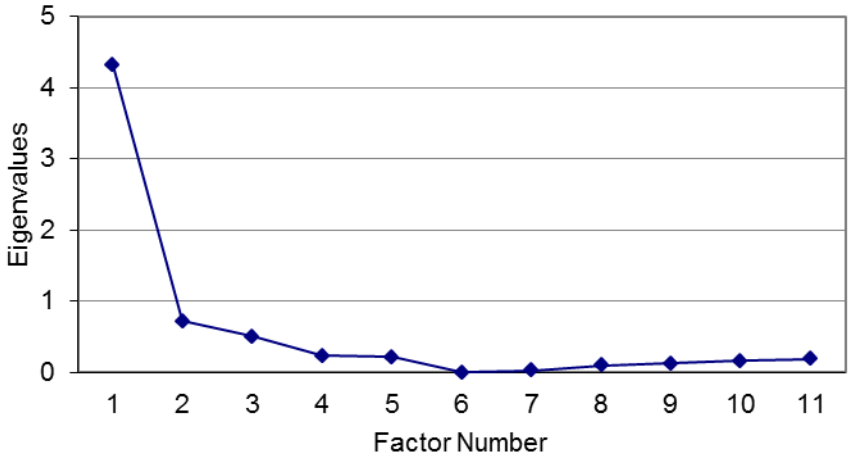

Figure 6. Scree plot of eigenvalues from the reduced correlation matrix

However, as can be seen from Table 2, a three-factor solution provided a significantly better fit to the data than either a one- or two-solution. Although a four-

factor model yielded a smaller RMSEA value than a three-factor model (.07 vs. 078), the overlap in their 90% confidence intervals (CI) indicated that no significant gains were made by adding greater complexity to the model.

Table 2

RMSEA Fit Indices for Progressively More Complex Factorial Structures

Model	χ^2	*df*	RMSEA	90% CI
One-factor	897.51	54	.15	.14-.16
Two-factor	464.87	43	.11	.11-.13
Tree-factor	171.84	33	.08	.07-.09
Four-factor	99.69	24	.07	.05-.08

Note. These RMSEA fit indices were computed using FITMOD (Browne, 1992), a computer program developed at the Ohio State University to calculate point and interval estimates of fit measures.

Given these findings, a three-factor model was tested, but the first attempt to obtain an interpretable three-factor solution using all 12 items failed. The "anomaly" observed in the initial solution resided in the unexpectedly low pattern coefficient (below the .32 heuristic) of one item (*We should provide medical care according to greatest need even if it means that wounded insurgents will receive treatment before wounded Canadian soldiers*). Hence, the analysis was repeated without this item and three intercorrelated factors with eigenvalues greater than one emerged (Table 3). Factor 1 comprises two items (items 9 and 10) pertaining to raters' attitudes towards the reporting of ethical infractions. Factor 2 comprises two survey questions (items 1 and 2) associated with raters' attitudes towards torture. Factor 3 comprises seven statements (items 3, 4, 5, 6, 7, 8, and 11) regarding raters' attitudes towards treatment of detainees and non-combatants. Together these three factors accounted for 50.70% of the variance.

Table 3

Pattern Coefficients and Communalities[9]

Item	Communalities	Pattern Coefficients		
		1	2	3
1	.69	.05	**.83**	-.02
2	.90	-.06	**.93**	.07
3	.39	.10	.06	**.53**
4	.18	-.08	-.09	**.50**
5	.38	.06	.11	**.35**
6	.38	.07	.17	**.48**
7	.58	.11	.19	**.58**
8	.37	.00	.05	**.59**
9	.66	**.67**	.06	.18
10	1.00	**1.05**	-.06	-.04
11	.25	.09	-.03	**.44**

Note. These statistics were computed using data from a single multiply imputed dataset. Because there were no substantive differences between these statistics and those computed using the other four multiply imputed datasets, only this set of results is reported. Pattern coefficients ≥ .32 are in bold (Tabachnick & Fidell, 2001).

Descriptive statistics and intercorrelations. Prior to computing the means, standard deviations, and correlations among measured variables, items related to raters' ethical attitudes were grouped into three parcels consistent with the factor structure presented in Table 3. The 10 items related to psychological distress were grouped into four parcels, namely nervousness, agitation, fatigue, and negative affects. These parcels were formed on the basis of a previous study on the factor structure of the K10 (Brooks, Beard, & Steel, 2006). As explained previously, each parcel was created by summing responses to the related survey questions.

[9] When an oblique rotation is performed, the factor loadings (or pattern coefficients) are standardized partial regression coefficients of the common factor predicting the manifest variable. As a result, these values may fall outside the range of -1 to +1 (Jöreskog, 1999).

The statistics presented in Table 4 were computed using data from a single multiply imputed dataset. Because there were no substantive differences between these statistics and those computed using the other four multiply imputed datasets, only this set of results is reported[10]. As shown, the means for combat exposure, the four item parcels associated with psychological distress, and the demographic variables fell below scale midpoints whereas the means for the item parcels related to ethical attitudes were mostly above scale midpoints. As for the correlation coefficients between measured variables, three sets of results are worthy of note. First, as shown in the colour-coded blocks, correlations among item parcels related to the same latent construct were all higher than correlations between each of these parcels and the other variables in the matrix. Second, correlations between combat exposure and item parcels related to psychological distress were stronger than those between combat exposure and item parcels related to ethical attitudes. Finally, only two (i.e., Agitation and Negative Affects) of the four item parcels related to psychological distress were correlated with the item parcels associated with ethical attitudes.

[10] The correlation matrices associated with the other four multiply imputed datasets are presented in Appendix J.

Table 4

Descriptive Statistics and Correlation Matrix (Study 1, Calibration Sample, Dataset 1)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11
1. Cbt. Exp.	56.28	17.08	34-170	–										
2. Nervous.	2.84	1.26	2-10	.28**	–									
3. Agitation	3.21	1.70	2-10	.30**	.54**	–								
4. Fatigue	3.82	1.72	2-10	.16**	.47**	.53**	–							
5. Neg. Aff.	5.36	2.38	4-20	.26**	.54**	.56**	.55**	–						
6. Reporting	6.83	2.11	2-10	-.18**	-.01	-.15**	-.04	-.14**	–					
7. Torture	6.25	2.43	2-10	-.11**	.01	-.09*	.01	-.07	.48**	–				
8. Gen. Att.	24.52	4.88	7-35	-.11**	-.07	-.14**	-.06	-.12**	.57**	.47**	–			
9. Rank	1.54	.85	1-4	-.11**	.00	-.09*	.00	-.08*	.38**	.30**	.34**	–		
10. Yrs. Svc.	2.34	1.48	1-6	-.05	.03	-.09*	-.02	-.07	.39**	.24**	.25**	.43**	–	
11. No. Tours	2.06	1.33	1-5	.13**	.05	-.05	-.01	-.04	.20**	.16**	.10**	.30**	.55**	–

Note. n = 693. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Evaluation of the measurement model. Upon the computation of descriptive statistics and intercorrelations among measured variables, the measurement model underlying the structural model depicted in Figure 4 was specified (see Appendix K), and its goodness-of-fit within each of the five multiply imputed datasets was evaluated**.** Table 5 presents fit indices based on data from the same dataset that served to compute the statistics reported in Table 4. Apart from a few trivial differences in the size of χ^2 statistics, CFI, and AIC values, there were no differences between these fit indices and those computed using the other four multiply imputed datasets (Appendix L). In all cases, the model fit the data remarkably well (e.g., $\chi^2[12] = 20.18$, $p = .06$), and adding a common method factor to the model made a consistent improvement to model fit (e.g., $\chi^2\Delta[1] = 9.47$, $p < .01$)[11]. Table 6 presents the pooled standardized parameter estimates for all indicators in the measurement model. As shown, all item parcels were strongly related to the latent construct they were hypothesized to measure; hence, no modifications were made to the measurement model. In the five multiply imputed datasets, the pooled composite reliability estimates for the two latent variables in the model were as follows: Psychological Distress, $\alpha_{CRCM} = .82$; Ethical Attitudes, $\alpha_{CRCM} = .74$.

[11] The "unmeasured" method factor accounted for 28% of the variance in the measured variables.

Table 5

Fit Indices for the Measurement Model (Study 1, Calibration Sample, Dataset 1)

Model	χ^2 Statistics		RMSEA						
	χ^2	*df*	(90% CI)	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta(1)$
1. Measurement model w/o method factor	29.65	13	.04 (.02-.06)	*ns*	.99	.98	.61	59.65	
2. Measurement model w/ method factor	20.18	12	.03 (.00-.05)	*ns*	.99	.99	.56	51.18	9.47^{**}

Note. RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, PNFI = Parsimony Normed Fit Index, and AIC = Akaike Information Criterion; $\chi^2\Delta$ = difference in χ^2 values between models.

$^{**}p < .01$

Table 6

Pooled Standardized Parameter Estimates for the Measurement Model (Study 1)

	Latent constructs	
Measured variables	Psychological Distress	Ethical Attitudes
Nervousness	.58	
…did you feel nervous?		
…did you feel so nervous that nothing could calm you down?		
Agitation	.69	
…did you feel restless or fidgety?		
…did you feel so restless that you could not stand still?		
Fatigue	.63	
…did you feel tired-out for no good reason?		
…did you feel that everything was an effort?		
Negative affects	.74	
…did you feel hopeless?		
…did you feel depressed?		
…did you feel so sad that nothing could cheer you up?		
…did you feel worthless?		
Attitudes towards torture		.59
Torture should not be allowed even if it might save the life of coalition personnel. (ethics1)		
Torture should not be allowed even if it would lead to important information about insurgents. (ethics2)		
Attitudes towards the reporting of battlefield infractions		.72
I would report breaches to the CF code of Conduct and Law of Armed Conflict even if it meant I… (ethics9)		
All breaches to the CF Code of Conduct and Law of Armed Conflict should be reported. (ethics10)		
General attitudes towards treatment of detainees and non-combatants		.74
All non-combatants should be treated with dignity and respect. (ethics3)		
I would not risk my own safety to help a non-combatant in danger. (ethics 4)		
Verbal threats to non-combatants should be allowed in order to gather important information about insurgents. (ethics5)		
The Law of Armed Conflict should not be followed when insurgents are not respecting them. (ethics6)		
All detainees should be treated with dignity and respect. (ethics7)		
Those who surrender do not need to be protected from the effects of hostilities. (ethics8)		
In conducting operations, I would expose myself to greater risk to minimize harm to civilians and their… (ethics11)		

Note. All loadings are significant at the .001-level (two-tailed).

Evaluation of the structural model. After establishing the fit of the measurement model, the three competing models were specified (see Appendix M for details) and their goodness-of-fit within each of the five multiply imputed datasets was evaluated. Table 7 presents the fit indices associated with each model. These fit indices were computed using data from a single multiply imputed dataset–the one that served to compute the statistics reported in Table 4. Here again, no substantive differences were observed between these fit indices and those computed using the other four multiply imputed datasets (see Appendix N for complete results). In all cases, the three models appeared to fit reasonably well. Nevertheless, in the interest of determining whether the partially mediated model provided a better fit to the data than the two competing models, a series of $\chi^2\Delta$ tests were performed. In all five datasets, the difference in χ^2 between the partially mediated model and the non-mediated model was significant (e.g., $\chi^2\Delta[1] = 8.34$, $p < .05$), indicating that the partially mediated model provided a better fit to the data than the non-mediated model. However, given that the partially mediated model and the fully mediated model provided equivalent fits to the data (e.g., $\chi^2\Delta[1] = 2.72$, *ns*), the fully mediated model was accepted based on the consideration of parsimony.

Table 7

Goodness-of-Fit Indices for Model Comparisons (Study 1, Calibration Sample, Dataset 1)

	χ^2 Statistics		RMSEA						
Model	χ^2	*df*	(90% CI)	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta(1)$
1. Partially mediated model	71.34	35	.04 (.03-.05)	*ns*	.98	.97	.62	133.34	
2. Fully mediated model	74.06	36	.04 (.03-.05)	*ns*	.98	.97	.63	134.06	2.72
3. Nonmediated model	79.68	36	.04 (.03-.05)	*ns*	.98	.97	.63	139.68	8.34*

Note. RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, PNFI = Parsimony Normed Fit Index, and AIC = Akaike Information Criterion; $\chi^2\Delta$ = difference in χ^2 values between models.

* $p < .05$.

Figure 7 presents the pooled standardized parameter coefficients for the fully mediated model[12]. Consistent with the indirect effect hypothesis, combat exposure was associated with psychological distress (β = .40, $p < .001$), which in turn, was associated with ethical attitudes (β = -.27, $p < .001$). As expected, rank (β = .38, $p < .001$) and years of service (β = .22, $p < .001$) were both associated with ethical attitudes, but contrary to hypothesis, number of UN/NATO tours was not associated with psychological distress (β = -.09, *ns*).

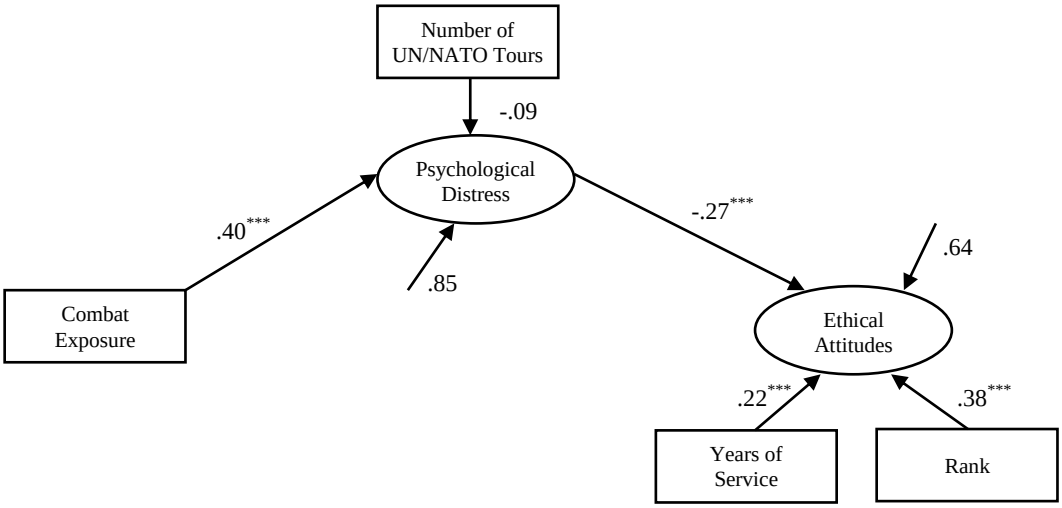

Figure 7. Pooled standardized parameter coefficients for the fully mediated model. The residual arrows denote the proportion of variance in the endogenous variables that was not accounted for by other variables in the model. Correlations between exogenous variables are not included in this figure to reduce its complexity and facilitate reading. *** $p < .001$.

Post hoc inspection of the model parameters in Figure 7 suggested that the non-significant path between number of UN/NATO tours and psychological distress (as well

[12] In the partially mediated model, the direct path between combat exposure and ethical attitudes (β = -.08, *ns*) was not statistically significant.

as one insignificant correlation between years of service and combat exposure) could be fixed to zero. Doing so did not change the fit of the model (e.g., $\chi^2\Delta[2] = 5.84$, *ns*; $\chi^2[38] = 79.90$, $p < .001$; RMSEA = .04; CFI = .98; TLI = .97; PNFI = .67; AIC = 135.90)[13], except in one dataset where the path between number of UN/NATO tours and psychological distress was highly significant ($\beta = .11$, $p < .01$). In all multiply imputed datasets, the standardized indirect effect of combat exposure on ethical attitudes was small (Cohen, 1988), but statistically significant; the average indirect effect was -.11 and the lower and upper bounds of the 90% bias corrected confidence interval ranged from -.18 to -.17 and from -.06 to -.05 respectively. The average squared multiple correlations for each endogenous variable in the fully mediated model were as follows: psychological distress, $R^2 = .15$; ethical attitudes, $R^2 = .36$.

Cross-sample validation. After establishing the fit of the structural model depicted in Figure 7, its invariance across the calibration and validation samples was evaluated. As explained previously (see the Statistical Analysis section), the first step in testing for multi-group invariance (or equivalence) is to assess whether the variables within the measurement and structural components of the model have the same pattern of existing and non-existing relationships across groups. This initial step was achieved by estimating the full structural equation model within both samples simultaneously. The results were as follows: $\chi^2/df < 3$; RMSEA = .03; CFI = .98; TLI $\geq$ .97; PNFI = .68; AIC $\leq$ 286.03.

[13] See Appendix N for the complete results.

Next, given evidence of configural equivalence, the null hypothesis that parameters within the measurement and structural components of the model are equivalent across groups was evaluated through a series of $\chi^2\Delta$ tests. As can be seen from Table 8 (and from the complete results presented in Appendix O), all measurement weights (factor loadings) and structural parameters of interest (i.e., those for the paths between combat exposure, psychological distress and ethical attitudes) were found to be equal across groups, attesting to the robustness of the model. The same result was observed for the path between years of service and ethical attitudes, but not for the path between rank and ethical attitudes or for the correlations between the exogenous variables.

Table 8

Chi-Square (χ^2) *Values for Tests of Multigroup Invariance (Study 1)*

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
Calibration Sample, Dataset 1 vs. Validation Sample, Dataset 1					
1. Baseline model; no equality constraints	167.66	77			
2. Measurement model; all factor loadings constrained equal	156.76	82	10.90	5	*ns*
3. Structural model; all regression paths constrained equal	180.59	85	12.93	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	189.66	90	22	13	*ns*
Calibration Sample, Dataset 1 vs. Validation Sample, Dataset 2					
1. Baseline model; no equality constraints	153.06	77			
2. Measurement model; all factor loadings constrained equal	159.80	82	6.74	5	*ns*
3. Structural model; all regression paths constrained equal	176.65	85	23.59	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	160.12	83	7.06	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	175.40	84	22.34	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	161.30	84	8.24	7	*ns*

Table 8 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
(Model D) Path between psychological distress and ethical attitudes constrained equal	163.09	85	10.03	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	177.00	90	23.94	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	169.07	86	16.01	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	169.32	87	16.26	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	175.24	88	22.18	11	.05
(Model H) Correlation between rank and combat exposure constrained equal	169.68	88	16.62	11	*ns*
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	170.68	89	17.62	12	*ns*
Calibration Sample, Dataset 1 vs. Validation Sample, Dataset 3					
1. Baseline model; no equality constraints	157.06	77			
2. Measurement model; all factor loadings constrained equal	163.50	82	6.44	5	*ns*
3. Structural model; all regression paths constrained equal	177.03	85	19.97	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	164.15	83	7.09	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	175.87	84	18.81	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	165.26	84	8.20	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	166.83	85	9.77	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	181.58	90	24.52	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	173.45	86	16.39	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	173.45	87	16.39	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	175.26	88	18.20	11	*ns*
(Model H) Correlation between rank and combat exposure constrained equal	177.04	89	19.98	12	*ns*
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	181.58	90	24.52	13	.05
Calibration Sample, Dataset 1 vs. Validation Sample, Dataset 4					
1. Baseline model; no equality constraints	161.46	77			

Table 8 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
2. Measurement model; all factor loadings constrained equal	168.01	82	6.55	5	*ns*
3. Structural model; all regression paths constrained equal	180.76	85	19.30	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	168.08	83	6.62	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	179.63	84	18.17	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	169.17	84	7.71	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	170.47	85	9.01	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	189.43	90	27.97	13	.01
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	173.63	86	12.17	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	173.68	87	12.22	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	180.74	88	19.28	11	*ns*
(Model H) Correlation between rank and combat exposure constrained equal	183.97	89	22.51	12	.05
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	185.81	89	24.35	12	.05
Calibration Sample, Dataset 1 vs. Validation Sample, Dataset 5					
1. Baseline model; no equality constraints	163.17	77			
2. Measurement model; all factor loadings constrained equal	169.98	82	6.81	5	*ns*
3. Structural model; all regression paths constrained equal	178.63	85	15.46	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	196.83	91	33.66	14	.01
(Model A) Correlation between years of service and number of UN/NATO tours constrained equal	187.80	87	24.63	10	.01
(Model B) Correlation between rank and number of UN/NATO tours constrained equal	181.70	87	18.53	10	.05
(Model C) Correlation between years of service and rank constrained equal	186.02	87	22.85	10	.05
(Model D) Correlation between rank and combat exposure constrained equal	183.68	87	20.51	10	.05
(Model E) Correlation between combat exposure and number of UN/NATO tours constrained equal	182.35	87	19.18	10	.05

Note. $\chi^2\Delta$ = difference in χ^2 values between models; Δdf = difference in the number of degree of freedom between models.

Discussion

As discussed previously (in the Literature Review), it is well established that combat exposure may lead to long-lasting mental health problems and temporary adjustment difficulties (see Hosek et al., 2006, for a detailed review). However, a growing number of clinicians and researchers are starting to realize that certain combat experiences, and perhaps combat exposure in general, can also be morally injurious. Yet, apart from two scholarly articles on the concept of "moral injury" (i.e., Litz et al., 2009; Dresher et al., 2011) and three recent U.S. military studies showing a link between combat exposure, mental health, and self-reporting of ethical violations (MHAT IV, 2006; MHAT V, 2008; Warner et al., 2011), there has been no quantitative research (or scholarly articles) on this topic.

Given this situation, and the absence of consensus concerning the process through which combat exposure could possibly affect ethical attitudes and behaviours, the purpose of Study 1 was to build and test a structural equation model integrating different perspectives on this process. Hence, three competing models were evaluated: (a) a direct effect model consistent with the hypothesis that the mere repeated exposure to hostile acts of violence can influence the way soldiers think about their ethical obligations, especially when upholding these obligations involves that they take greater risks to minimize harm to people they don't know (e.g., local civilians), or to protect those who were responsible for these acts (e.g., wounded insurgents, detainees); (b) a fully mediated model consistent with the notion that a decline in ethical dispositions are one of many possible

complications arising from symptoms of psychological distress; and (c) a partially mediated model integrating both points of view.

Prior to testing the fit of the three competing models, the computation of descriptive statistics revealed that, on average: (a) survey respondents had been exposed to at least one kind of combat stressor since their arrival in theatre, (b) that they had experienced minor symptoms of distress (including nervousness, agitation, fatigue, and negative affects) in the four weeks preceding survey administration, and (c) had reported holding either neutral or slightly positive attitudes towards the ethics-related statements that were presented to them in the survey. Among these statements, those regarding treatment of detainees received the least favourable ratings whereas those pertaining to raters' attitudes towards treatment of non-combatants received the most positive ratings (see Appendix H for details). Overall, these last results paint a similar picture to what was seen in the MHAT IV (2006) and MHAT V (2008) reports on battlefield ethics.

With regards to the expected association between combat exposure, mental health symptoms, and ethical attitudes, all three models provided a reasonably good fit to the data. However, when accounting for the effect of common method variance, the fully mediated model provided a significantly better fit to the data than any of the alternative models. In other words, this study has found that combat exposure exerts a significant effect on ethical attitudes, but that this effect is fully mediated by mental health. As for the hypothesized effect of the three control variables (i.e., rank, number of UN/NATO tours, and years of service), the results were only partially consistent with expectations. While rank and years of service–two proxy-measures of one’s level of organizational

socialization– were effectively related to ethical attitudes, this study found no relationship between number of tours and psychological distress. One possible explanation for this finding could be that veterans with ongoing mental health problems were screened out before deployment and thus did not get to participate in this research. Alternatively, it could also be that the proportion of soldiers who were rendered more fragile by their previous deployment experience might have been roughly equal to the number of soldiers who were rendered more resilient as a result of their previous deployment experience, thereby cancelling the effect of deployment experience on mental health (cf. Adler, Huffman, Bliese, & Castro, 2005). Whatever the reason, though, the preceding results appear to be relatively stable in that most parameters were found to be invariant across the calibration and validation samples.

This study extends previous research in two important ways. *First*, it shows that the stress and strain of asymmetric warfare–not only the toxic influence of a poisonous work environment–can indirectly damage one's "moral compass", which might partly explain why an important minority of U.S. soldiers have reportedly engaged in unethical combat behaviors during their deployment in Iraq and Afghanistan (Castro & McGurk, 2007b; MHAT V, 2008). *Second*, unlike a recent MHAT-based study, which, after controlling for combat experiences, found that positive screening for PTSD or depression is not a significant predictor of self-reported breakdowns in battlefield conduct (see Warner et al., 2011, for details), the present study provides some preliminary indications that combat experiences are relevant for predicting unethical battlefield behaviours only insofar as they generate some psychological distress among soldiers. The discrepancy

between the results may be explained by the fact that Warner and his associates chose to dichotomize the scores on their measures of PTSD and depression instead of treating them as continuous variables. Indeed, it is likely that by grouping scores into two categories (i.e., either above or below the minimum screening threshold for PTSD or depression) they also "threw away" some useful score variance and thus missed an opportunity to find a significant association between mental health problems and unethical battlefield conduct.

Given these findings, and the fact that exposure to violence and its aftermath is an inherent aspect of military life in a war zone, one logical question is: What can military leaders do to enhance the moral resilience of their troops? *First,* given the link between psychological distress and ethical attitudes, it is critical that soldiers be given sufficient access to mental health resources during deployment and that unit leadership be held accountable to create the best possible conditions for individual adjustment by removing or attenuating all environmental and psychological stressors that are within organizational control (cf. Warner & Appenzeller, 2011). Countering the popular belief that combat-related stressors are the main source of operational stress for soldiers, studies based on survey data from Canadian personnel involved in peacekeeping or stability operations have repeatedly demonstrated that career issues (e.g., conditions of service such as pay and allowances, the quality of personal clothing and equipment, and administrative support) are among the main sources of concerns for soldiers. Issues related to the work environment (e.g., double standards in the applications of rules and the attribution of privileges, supervisors overreacting to situations), living conditions, and separation from

family may also affect personnel, but to a lesser extent (Blanc & Kelloway, 2012). *Second*, the moderate relationship between proxy-measures of one's level of organizational socialization (i.e., rank and years of military service) and one's ethical attitudes, suggests that instigating organizational ethics programs-or strengthening the existing ones-could possibly mitigate the indirect effect of combat exposure on the ethical attitudes of soldiers. *Finally*, as discussed previously, it is also possible that maintaining a positive social climate within units could shield soldiers from the adverse effects of deployment stressors and indirectly contribute to their moral (or ethical) resilience. Here, then, lies the focus of the next study.

Study 2

The purpose of the second study was threefold. One goal was to determine whether the results of the first study could be replicated in a different sample of deployed personnel, hence the reason for testing a model that includes a direct path between combat exposure and ethical attitudes even though this path was found to be non-significant in the first study. The second objective was to assess whether a social climate characterized by good leadership, high morale, strong cohesion, and a shared ethos can moderate the relationship between combat exposure and two outcomes, namely psychological distress and ethical attitudes. In order to test these hypotheses, an expanded structural model was proposed (Figure 8). This structural model is based on Preacher's path analytic framework for combining mediation and moderation (see Preacher, Rucker, & Hayes, 2007). The one new measure (i.e., social climate) is shown in bold type.

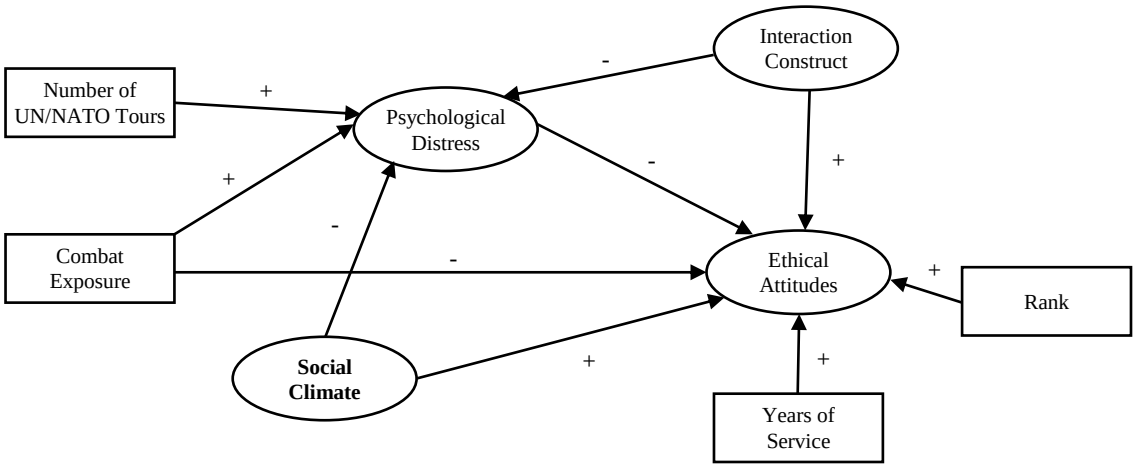

Figure 8. Expanded model combining moderation of direct and indirect effects. Correlations between exogenous variables are not included in this figure to reduce its complexity and facilitate reading.

Finally, given the existence of small body of research showing that job tenure, occupational level, and a history of lifetime adversity may influence relationships among individual and contextual factors (e.g., Bradley, 2007; Begley, Lee, & Hut, 2006; Seery, Holman, & Silver, 2010), a third objective was to evaluate whether the relationships depicted in Figure 8−notably the "buffering" effects of social climate perceptions−vary as a function of years of service, rank, and operational experience. Though these characteristics are generally regarded as nuisance variables whose effects must be statistically controlled (Bradley, 2007), it has also been advocated that those involved in occupational stress research should make a point of differentiating between workers at different stages of their careers (Brenner & Bartell, 1984). From a theoretical stand-point, these distinctions might help "lift the veil" on relationships that would otherwise be concealed, which could, in turn, have a practical significance for training and personnel management.

With regards to the moderator effect of job tenure, two studies are worthy of note. In the first study (see Bradley, 2007, for details), a sample of experienced (two or more years of teaching) and comparatively inexperienced high school teachers (less than two years of teaching) were administered a survey to assess the main and interactive effects of job demands, control, and social support on strain (i.e., stress, job dissatisfaction, and turnover intentions), and, more particularly, to investigate the higher-order moderating effect of job tenure on these relationships. Results showed that, in both samples, each job factor (i.e., demands, control, and support) was predictive of strain, but, contrary to expectations, the strength of these associations did not vary as a function of tenure status.

In contrast, the demand x control interaction predicted both job dissatisfaction and turnover intentions in the group of inexperienced teachers, but not in the experienced group.

In the second study (see English, Morrison, & Chalon, 2010), the authors hypothesized that the relationships between psychological climate dimensions (i.e., supervisor involvement, interpersonal relationships, transformational leadership, organizational image of prestige, and organizational image of integrity) and affective commitment would be moderated by organizational tenure. Based on the work of career-stage theorists, they suggested that: (a) the needs of employees and the criteria against which they assess the organizational environment shift over time, and (b) that the extent to which affective commitment increases or decreases is dependent on the match between those needs and individual perceptions of the work environment. Thus, three groups of public sector employees were surveyed: employees with less than one year's tenure (n = 87), one to nine years (n = 232), and more than nine years (n = 258). Each group completed a measure of affective commitment as well as a multi-dimensional measure of psychological climate. As expected, analyses revealed that the work climate variables were significantly and positively correlated with affective commitment, and that the strength of these associations varied according to the length of time an individual had been employed with the organization−less tenure generally resulted in stronger associations.

With regards to the interactive effect of rank, the few available studies are pointing in the same general direction as the research concerning the influence of

organizational tenure. For example, the authors of a cross-sectional study involving 605 employees of a Chinese steel conglomerate have found evidence suggesting that low-level and high-level employees are not concerned (or affected) by the same issues and react differently to problems (see Begley et al., 2006, for details). Specifically, they found that procedural justice evaluations were better predictors of commitment, intentions to quit, and conscientiousness among low-level employees, whereas issues relative to distributive justice showed stronger relationships with the same outcomes plus organizational trust among those at higher organizational levels. Additionally, they found a significant, yet unexpected three-way interaction indicating that high procedural justice intensifies the effect of distributive justice on job satisfaction among high level employees, but not among low-level employees. Even though organizational justice and its behavioural and attitudinal consequences are not the variables of focal interest in the current study, the general finding that "rank matters" provides an impetus to evaluate whether the strength of the associations depicted in Figure 8 vary as a function of organizational level.

The last moderator to be considered in this study is the number of times an individual has been deployed. The decision to include this variable among the list of possible moderators stems from research findings suggesting that prior exposure to stressful life events can, in certain circumstances, increase our resistance to subsequent stress. One of the first studies to have investigated this "stress inoculation" effect outside of laboratory settings was conducted in the mid-eighties following two severe floods (1981; 1984) in southeastern Kentucky (see Norris & Murrell, 1988). Two hundred and

thirty four adults (aged 55 or older) were interviewed in this study. Participants were asked questions relative to anxiety, experience with floods, and exposure to other traumatic events over the course of their life. Data analysis was conducted through hierarchical regression, using anxiety as the outcome variable. Overall, the results showed that those who had been previously exposed to floods (and to other traumatic life events) experienced less anxiety following the second flood than those with no prior flood experience.

In a more recent study (see Seery et al., 2010, for details), the authors used a large sample of adults (N = 2,398) drawn from the general U.S. population to investigate the boundary conditions under which prior lifetime adversity can be expected to protect against the negative effects of recent adversity. Two hypotheses were tested: the first hypothesis was that a history of low adversity would predict better mental health and well-being outcomes than histories of no or high adversity; the second hypothesis was that low prior lifetime adversity would predict resilience in the face of recent adversity whereas histories of no or high adversity would not. As expected, relative to people with a history of no or high lifetime adversity, those with a history of some lifetime adversity reported lower global distress, lower functional impairment, lower post-traumatic stress symptoms, and higher life satisfaction. Additionally, across these same outcome measures, people with a history of low lifetime adversity were less negatively affected by recent adverse events than those who had experienced either no or high adversity.

Taken together, the aforementioned studies provide some empirical grounds to justify testing whether the relationships depicted in Figure 8 vary as a function of

seniority−represented by rank and years of service−and operational experience. With regards to rank and years of service, it is expected that the links between combat exposure and the two outcome variables will be stronger among novice and low-ranking personnel for the reason that they are less likely to have learned how to effectively cope with these stressors and to have received military training and education that emphasize moral thinking (cf. Brewer & Shapard, 2004; Rest, Davidson, & Robbins, 1978). Likewise, the direct and interactive effect of social climate perceptions are expected be stronger among novice and low-ranking personnel because the collaborative/team-based nature of their work is likely to raise the salience of their social needs and provide a context for the satisfaction (or dissatisfaction) of these needs[14]. Lastly, based on studies relative to stress inoculation, it is expected that having more than one operational deployment will attenuate the relationship between combat exposure and the two outcome variables, but that the direct and interactive effects of social climate will be stronger among those who have only one tour. These individuals are likely to have fewer years of military service, and because much of their work is presumably done in team, it is postulated that social work factors will have stronger effects on them than on those who have more than one operational deployment.

Method

Data. The data for this study was provided by the Director General Military Personnel Research and Analysis. The original data file contained the survey responses of 866 CF personnel that completed the in-theatre version of the HDO survey during the

[14] In the early stages of their military careers, soldiers work in small groups between 10 and 12 called sections. Tasks are assigned to sections, and section members work collaboratively to complete those tasks.

period from 01 August to 31 August, 2010[15]. However, upon inspection of the data, 34 cases were deleted. Of those 34 cases, 14 had completed the French version of the HDO survey, 16 had skipped 20% or more of the survey questions, and four cases had provided internally inconsistent data (e.g., reported being senior officers with 5 years of military service or less). Upon removal of these cases, the amount and distribution of missing values was examined. As with Study 1, it was found that: (a) the nominal and ordinal variables from the background information section of the survey had the greatest percentage of cases with missing values (up to 10.5%), whereas the quantitative (scale) variables had very few cases with missing values (no more than 2.0%); (b) that the data was likely missing at random, and (c) that the most common pattern of non-responding was to skip many background information questions, presumably to protect one's own identity. Given these findings, missing values were imputed through multiple-imputations using the Missing Value Analysis add-on package for SPSS 19.0. This step resulted in the creation of 5 complete datasets. Then, using the diagnostic tests implemented in AMOS 18.0, each complete dataset was screened for the violation of important statistical assumptions. This resulted in the additional removal of 13 multivariate outliers as well as in the decision to use bootstrapping to handle the non-normal distribution of the data[16]. No issues related to multicollinearity and singularity were detected. Table 9 presents the military and socio-demographic characteristics of the sample. Compared to official data (see Appendix C), it seems that the distribution of ranks corresponds to that of the larger population from which the two samples were drawn, but that members of headquarters

[15] This corresponds to a 25% response rate.
[16] No transformations were made as the data was not expected to be normally distributed in the population.

and manoeuvre units were respectively under- and over represented by approximately six to ten percent.

Table 9

Military and Socio-Demographic Characteristics of Respondents (N = 819)

		Count[a]	Valid[b] %
Rank	Junior NCM	531	70.7
	Senior NCM	133	17.7
	Junior officers	68	9.1
	Senior officers	19	2.5
Home situation	Married	164	21.7
	Married with dependents	237	31.4
	Single	312	41.3
	Single with dependents	42	5.6
Component	Regular (Full-time)	589	76.7
	Reserve (Part-time)	179	23.3
Years of service	5 or less	307	40.2
	6 to 10	205	26.9
	11 to 15	100	13.1
	16 to 20	69	9.0
	21 to 25	50	6.6
	26 or more	32	4.2
Number of tours	1	437	57.7
	2	133	17.6
	3	67	8.9
	4	49	6.5
	5 or more	71	9.4
Unit type	Headquarters	19	2.6
	Manoeuvre	374	50.9
	Support/sustainment	306	41.6
	Other	36	4.9

Note. NCM = Non-commissioned member; married includes common-law; single includes divorced, widowed, and separated; and dependents include children and elderly parents. [a]Numbers may not add up to 819 because of missing data. [b]Percentages may not add up to 100 because of rounding.

Measures. Questions used to measure the background characteristics of the sample, their level combat exposure, psychological distress, and ethical attitudes were the same as those used in Study 1 (see Appendix D to G). The social climate variable was measured with soldiers' answers to single item measures of morale (*In my unit, there is a collective enthusiasm and persistence in pursuing our assigned goals*), cohesion (*We 'stick together', which enhances our ability to achieve our assigned goals*), leadership (*My immediate supervisor has effective leadership behaviours*), and shared ethos (*In my unit, we have a shared system of beliefs, values, and attitudes [integrity, courage, loyalty, etc.] that are valued by and define members of the military*). These questions came from the Unit Climate section of the HDO Survey (Appendix I). Answers were recorded on a five-point scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*).

Data Analyses. As noted previously, the decision to impute missing values through multiple-imputations resulted in the creation of 5 complete datasets. Hence, as in Study 1, the statistical analyses described below were performed on each dataset separately. Results were combined using an Excel calculator implementing Rubin's (1987) formulas for combining outputs of multiply imputed datasets.

The first set of analyses consisted in computing the means, standard deviations, and correlations among the study variables[17]. Next, the measurement model underlying the structural model depicted in Figure 8 was evaluated. This evaluation was made using the same fit indices as those used in Study 1.

[17] Readers wishing to see descriptive statistics concerning the rate of exposure to the potentially stressful situations listed on the Stress on Operations scale and the rate of endorsement to the statements listed on the Moral Climate (ethical attitudes) scale are referred to Appendix H.

Upon establishing the fit of the measurement model, the composite reliability of the latent constructs was assessed, and the structural model illustrating the process through which social climate perceptions could theoretically shield soldiers from the adverse effects of combat exposure was evaluated through latent variable path analysis using a 1000 bootstrap samples and the Maximum Likelihood discrepancy function implemented in AMOS 18.0. There are many advantages of using latent variable path analysis over conventional piecemeal approaches in which mediation and moderation are analyzed separately–say through multiple regression–and their results interpreted jointly. One advantage is that the former accommodates the simultaneous testing of mediation and moderation, which reduces the probability of making Type I errors. A second advantage is that it corrects variables for measurement error, which in turn increases power. Third, latent variable path analyses provide a framework to handle violation of statistical assumptions underlying procedures that rely on regression analysis, specifically the assumption that variables in the model are normally distributed (Edwards & Lambert, 2007).

Given the advantages that the latent variable approach to moderation testing provides, numerous authors have proposed techniques to represent latent moderators (or latent interaction constructs) within path analysis frameworks (e.g., Lin, Wen, Marsh, & Lin, 2010; Little, Bovaird, Widaman, 2006; Ping, 1996). However, the literature that describe these methods generally speaks to statisticians rather than applied researchers (Williams, Vandenberg, & Edwards, 2009) and implementation complexities have made some of these techniques impractical to use (Marsh, Wen, & Hau, 2004). In the present

study, the latent interaction construct was represented with product-indicators that were created using the *orthogonalizing* approach described by Little, Card, Bovaird, Preacher, & Crandall (2007). This technique is comparatively easy to implement and evidence based on simulations attest to its precision relative to other methods such as *mean-centering* of variables before product terms are computed (see Little, Bovaird, & Widaman, 2006, for comparisons). To create these product-indicators, all possible products between combat exposure and the four indicators of the social climate construct were computed. Next, these product terms were regressed onto the set of indicators representing the main-effect constructs, namely combat exposure and social climate. For each regression, the unstandardized residuals were saved as a new variable in the dataset and then brought into the structural equation model to serve as indicators of the latent interaction construct.

Upon modeling the interaction construct, five competing structural models were evaluated: (a) a direct effect and first stage moderation model as shown in panel A, (b) a direct effect moderation model as represented in panel B, (c) a first stage moderation model as illustrated in panel C, (d) a partially mediated model as shown in panel D, and (e) a fully mediated model as depicted in panel E (Figure 9). Nested models were compared using $\chi^2\Delta$ tests. Statistically significant interaction effects were plotted in Excel using their unstandardized estimates. The possible effect of common method variance was evaluated and controlled for using the same procedures as those employed in Study 1.

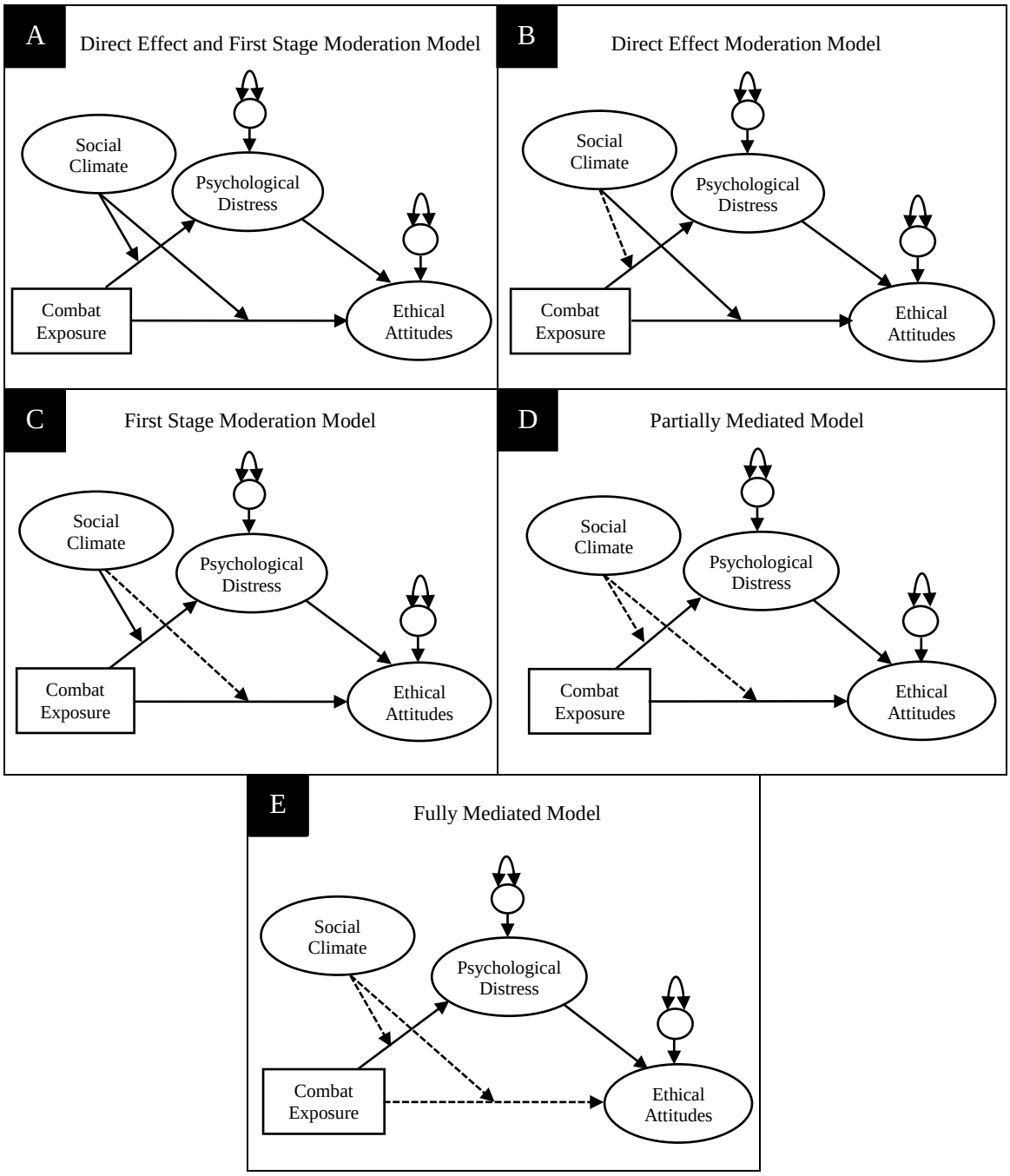

Figure 9. Competing structural models (without control variables) for Study 2. Dashed lines represent paths that are constrained to zero.

Results

Descriptive statistics and intercorrelations. Prior to computing the means, standard deviations, and correlations among variables, items related to ethical attitudes and psychological distress were grouped into parcels based on the same clustering schemes as those used in Study 1. The statistics presented in Table 10 were computed using data from a single multiply imputed dataset. Given that there were no substantive differences between these statistics and those computed using the other four multiply imputed datasets, only this set of results is reported.[18] As shown, the means for combat exposure, the four item parcels associated with psychological distress, and the demographic variables fell below scale midpoints whereas the means for the item parcels related to ethical attitudes and the four indicators related to the social climate construct (i.e., ethos, morale, cohesion, and leadership) were all above scale midpoints. As for the correlation coefficients between variables, three sets of results are worth nothing: First, the correlations between combat exposure and the three item parcels related to ethical attitudes were higher in Study 2 than they were in Study 1. Second, the correlations between combat exposure and the four item parcels related to psychological distress were lower in Study 2 than they were in the first study. Third, the correlations between the demographic variables (i.e., rank, years of service, and number of UN/NATO tours) and the three item parcels related to ethical attitudes (i.e., reporting, torture, and general attitudes towards treatment of detainees and non-combatants) were comparatively strong. Apart from this, though, the correlations were all of the expected size and direction.

[18] The descriptive statistics and correlation matrix associated with the other four multiply imputed datasets may be found in Appendix Q.

Table 10

Descriptive Statistics and Correlation Matrix (Study 2, Dataset 1)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Cbt. Exp.	55.74	18.28	34-170	–														
2. Nervous.	3.06	1.49	2-10	.24**	–													
3. Agitation	3.33	1.88	2-10	.22**	.62**	–												
4. Fatigue	3.91	1.85	2-10	.20**	.60**	.63**	–											
5. Neg. Aff.	5.53	2.92	4-20	.19**	.65**	.59**	.65**	–										
6. Reporting	6.78	2.00	2-10	-.17**	-.12**	-.12**	-.10**	-.10**	–									
7. Torture	6.33	2.35	2-10	-.15**	-.11**	-.10**	-.09*	-.10**	.52**	–								
8. Gen. Att.	24.58	4.62	7-35	-.21**	-.23**	-.18**	-.21**	-.22**	.54**	.52**	–							
9. Ethos	3.70	1.07	1-5	.06	-.08*	-.08*	-.15**	-.20**	.16**	.14**	.19**	–						
10. Morale	3.66	1.10	1-5	.03	-.12**	-.12**	-.18**	-.25**	.17**	.13**	.20**	.75**	–					
11. Cohesion	3.76	1.12	1-5	.12**	-.08*	-.06	-.12**	-.18**	.07*	.07*	.09*	.69**	.75**	–				
12. Leadership	3.87	1.16	1-5	.09**	-.05	-.07*	-.13**	-.18**	.07	.05	.06	.50**	.51**	.55**	–			
13. Rank	1.54	.90	1-4	-.03	.00	.02	.03	.00	.22**	.19**	.23**	.06	.08*	.02	-.02	–		
14. Yrs. Svc.	2.33	1.48	1-6	-.09**	-.06	-.08*	-.03	-.04	.25**	.18**	.26**	.06	.05	.00	-.00	.45**	–	
15. No. Tours	2.04	1.41	1-5	.09*	.00	-.02	.01	-.02	.12**	.09**	.12**	.01	.03	.03	.05	.34**	.60**	–

Note. N = 819. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Evaluation of the measurement model. Upon the computation of descriptive statistics and intercorrelations among measured variables, the measurement model underlying the structural model depicted in Figure 8 was specified (see Appendix R), and its goodness-of-fit within each of the five multiply imputed datasets was evaluated**.** Table 11 presents fit indices based on data from the same dataset that served to compute the statistics reported in Table 10. Apart from a few trivial differences in the size of χ^2 statistics, TLI, and AIC values, there were no differences between these fit indices and those computed using the other four multiply imputed datasets (Appendix S). In all cases, the model fit the data reasonably well, and adding a common method factor to the model made a significant improvement to model fit (e.g., $\chi^2\Delta[1] = 17.57$, $p < .01$)[19]. Table 12 presents the pooled standardized parameter estimates for all indicators in the measurement model. As shown, all variables and item parcels were strongly related to the latent construct they were hypothesized to measure; hence, no modifications were made to the measurement model. In the five multiply imputed datasets, the pooled composite reliability estimates for the three latent variables in the measurement model were as follows: Psychological Distress, $\alpha_{CRCM} = .86$; Ethical Attitudes, $\alpha_{CRCM} = .75$; Social Climate, $\alpha_{CRCM} = .87$.

[19] The latent method factor accounted for 18% of the variance in the measured variables, which is comparatively less than in Study 1 where the method factor accounted for 28% of the variance in the measured variables.

Table 11

Fit Indices for the Measurement Model (Study 2, Dataset 1)

Model	χ^2 Statistics		RMSEA						
	χ^2	*df*	(90% CI)	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta(1)$
1. Measurement model w/o method factor	120.05	41	.05 (.04-.06)	*ns*	.98	.97	.72	170.05	
2. Measurement model w/ method factor	102.48	40	.04 (.03-.05)	*ns*	.99	.98	.71	154.48	17.57**

Note. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; PNFI = Parsimony Normed Fit Index; AIC = Akaike Information Criterion; $\chi^2\Delta$ = difference in χ^2 values between models.

** $p < .01$

Table 12

Pooled Standardized Parameter Estimates for the Measurement Model (Study 2)

	Latent constructs		
Measured variables	Psychological Distress	Ethical Attitudes	Social Climate
Nervousness	.74		
Agitation	.72		
Fatigue	.76		
Negative affects	.81		
Attitudes towards torture		.70	
Attitudes towards the reporting of battlefield infractions		.77	
General attitudes towards treatment of detainees and non-combatants		.67	
Ethos (*In my unit, we have a shared system of beliefs, values, and attitudes…*)			.73
Morale (*In my unit, there is a collective enthusiasm and persistence in pursuing our...*)			.81
Cohesion (*We 'stick together', which enhances our ability to achieve our assigned tasks*.)			.75
Leadership (*My immediate supervisor has effective leadership behaviours.*)			.50

Note. All loadings are significant at the .001-level (two-tailed).

Evaluation of the structural model. After establishing the fit of the measurement model, the five competing models were specified (see Appendix T for an example of model specification) and their goodness-of-fit within the five multiply imputed datasets was evaluated. Table 13 presents fit indices associated with each model. These fit indices were computed using data from a single multiply imputed dataset−the one that served to compute the statistics reported in Table 9. Here again, no substantive differences were observed between these fit indices and those computed using the other four multiply imputed datasets (see Appendix U for complete results). In all cases, the five models appeared to fit reasonably well.

Nevertheless, in the interest of determining whether Model 1−the direct effect and first stage moderation model−was superior to the alternative models, a series of $\chi^2\Delta$ tests were performed. In all five datasets, deleting the paths between the interaction term and the two outcome variables (i.e., psychological distress and ethical attitudes) did not result in a significant change to model fit (e.g., $\chi^2\Delta$ [2] = 3.20, *ns*), suggesting that positive social climate perceptions generally do not attenuate (or exacerbate) the effect of combat exposure on psychological distress and ethical attitudes. However, contrary to Study 1, deleting the path between combat exposure and ethical attitudes resulted in a significant change to model fit (e.g., $\chi^2\Delta$ [3] = 19.30, $p < .01$), indicating that in this sample the relationship between combat exposure and ethical attitudes was partially mediated by psychological distress.

Table 13

Goodness-of-Fit Indices for Model Comparisons (Study 2, Dataset 1)

Model	χ^2 Statistics		RMSEA	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta$	Δdf
	χ^2	*df*	(90% CI)							
1. Direct effect and first stage moderation model	361.91	135	.05 (.04-.05)	*ns*	.97	.96	.75	471.91		
2. Direct effect moderation model	363.80	136	.05 (.04-.05)	*ns*	.97	.96	.76	471.80	1.89	1
3. First stage moderation model	362.89	136	.05 (.04-.05)	*ns*	.97	.96	.76	470.89	.98	1
4. Partially mediated model w/o moderation	365.11	137	.05 (.04-.05)	*ns*	.97	.96	.76	471.11	3.20	2
5. Fully mediated model w/o moderation	381.21	138	.05 (.04-.05)	*ns*	.97	.96	.77	485.21	19.30**	3
6. Partially mediated model w/o moderation and insignificant paths	377.98	144	.05 (.04-.05)	*ns*	.97	.96	.80	507.95	12.87	7

Note. RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, PNFI = Parsimony Normed Fit Index, and AIC = Akaike Information Criterion; $\chi^2\Delta$ = difference in χ^2 values between models. Model 6 was compared to Model 4, hence the 7 *df*.

** $p < .01$

Figure 10 presents the pooled standardized parameter coefficients for Model 4, the partially mediated model without moderation effects. Consistent with the indirect effect hypothesis, combat exposure was associated with psychological distress ($\beta = .30$, $p < .001$), which in turn was associated with ethical attitudes ($\beta = -.27$, $p < .001$). Contrary to Study 1, though, the relationship between combat exposure and ethical attitudes was statistically significant ($\beta = -.18$, $p < .001$), indicating that combat exposure may still damage the ethical attitudes of those who report fewer or no symptoms of mental health problems. Although no moderation effects were detected, the main effect of social climate on psychological distress was relatively strong ($\beta = -.40$, $p < .001$), indicating that no matter how much combat exposure they had had, respondents with positive social climate perceptions reported fewer symptoms of psychological distress than those with negative social climate perceptions. As in Study 1, rank ($\beta = .25$, $p < .001$) and years of service ($\beta = .16$, $p < .001$) were both associated with ethical attitudes, but contrary to some research (e.g., McCarroll et al., 1997; Wolfe et al., 1999), number of UN/NATO deployments was yet again non-associated with psychological distress ($\beta = -.04$, *ns*).

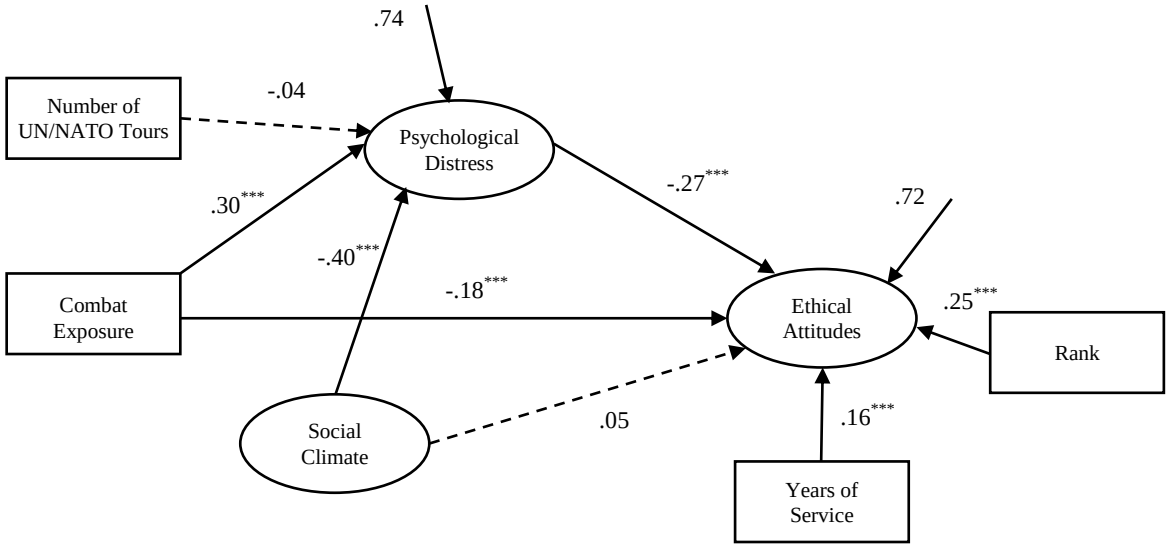

Figure 10. Pooled standardized parameter coefficients for Model 4, the partially mediated model without moderation effects. The residual arrows denote the proportion of variance in the endogenous variables that was not accounted for by other variables in the model. Correlations between exogenous variables are not included in this figure to reduce its complexity and facilitate reading.

*** $p < .001$.

Post hoc inspection of the model parameters in Figure 10 suggested that non-significant paths could be fixed to zero (or deleted). Doing so did not change the fit of the model (e.g., $\chi^2\Delta[7] = 12.87$, *ns*; $\chi^2/df = 2.62$, $p < .001$; RMSEA = .04; CFI = .97; TLI = .96; PNFI = .80; AIC = 507.95)[20]. Table 14 presents the direct, indirect, and total effects of main constructs on ethical attitudes. As shown, of the average total effect of combat exposure (-.26) and social climate (.13) on ethical attitudes, 35% and 100%, respectively, were indirect. The average squared multiple correlations for each endogenous variable in

[20] See Appendix U for the complete results.

the partially mediated model were as follows: psychological distress, R^2 = .26; ethical attitudes, R^2 = .28.

Table 14

Standardized Direct, Indirect, and Total Effects [and their 90% Bias-Corrected CI] of Main Constructs on Ethical Attitudes

	Combat Exposure			Social Climate
Dataset	Direct	Indirect	Total	Indirect/Total
1.	-.16 [-.22, -.10]	-.09 [-.13, -.06]	-.25 [-.32, -.20]	.12 [.09, .18]
2.	-.18 [-.23, -.12]	-.09 [-.13, -.07]	-.27 [-.34, -.22]	.13 [.08, .18]
3.	-.17 [-.22, -.12]	-.09 [-.13, -.07]	-.26 [-.32, -.21]	.13 [.09, .18]
4.	-.18 [-.24, -.13]	-.09 [-.13, -.07]	-.27 [-.33, -.21]	.13 [.09, .18]
5.	-.16 [-.22, -.11]	-.09 [-.13, -.07]	-.25 [-.31, -.20]	.13 [.09, .18]
Pooled	-.17	-.09	-.26	.13

Note. Social climate perceptions had no direct effect on ethical attitudes; their effect was fully mediated by psychological distress.

Moderator effects based on military background. Analyses were conducted using the same testing procedures as those used in Study 1 to evaluate the invariance of the structural model across the calibration and validation samples (see p. 30 for details). However, as discussed earlier, groups were formed on the basis of ranks, organizational tenure, and operational experience rather than through random assignment. With regards to rank, participants of the ranks of Private to Master-Corporal were assigned to the Junior Ranks group whereas those of the ranks of Sergeant and above were assigned to the Senior Ranks group. Next, the fit of Model 1 (the direct effect and first stage moderation model) was estimated within both samples simultaneously. This yielded a χ^2 value against which all subsequently specified invariance models were compared. As shown in Table 15, none of the $\chi^2\Delta$ tests based on rank met the minimum threshold for statistical significance. In all datasets, the measurement and structural parameters tested

were found to be invariant across groups, suggesting that rank does not moderate the relationship among the constructs of focal interest in this study.

Table 15

Chi-Square (χ^2) *Values for Tests of Multigroup Moderation (Junior Ranks vs. Senior Ranks)*

Model description	χ^2	*df*	$\chi^2\Delta$	Δ *df*	Statistical significance
Junior Ranks, Dataset 1 (n = 551) vs. Senior Ranks, Dataset 1 (n = 268)					
1. Baseline model; no equality constraints	543.80	245			
2. Measurement model; all factor loadings constrained equal	551.06	253	7.26	8	*ns*
3. Structural model; all regression paths constrained equal	561.53	262	17.73	17	*ns*
Junior Ranks, Dataset 2(n = 548) vs. Senior Ranks, Dataset 2 (n =271)					
1. Baseline model; no equality constraints	504.46	245			
2. Measurement model; all factor loadings constrained equal	513.48	253	9.02	8	*ns*
3. Structural model; all regression paths constrained equal	527.43	262	22.97	17	*ns*
Junior Ranks, Dataset 3 (n = 556) vs. Senior Ranks, Dataset 3 (n = 263)					
1. Baseline model; no equality constraints	524.88	245			
2. Measurement model; all factor loadings constrained equal	535.82	253	9.94	8	*ns*
3. Structural model; all regression paths constrained equal	550.63	262	25.75	17	*ns*
Junior Ranks, Dataset 4 (n = 548) vs. Senior Ranks, Dataset 4 (n = 271)					
1. Baseline model; no equality constraints	531.42	245			
2. Measurement model; all factor loadings constrained equal	540.94	253	9.52	8	*ns*
3. Structural model; all regression paths constrained equal	553.30	262	21.88	17	*ns*
Junior Ranks, Dataset 5 (n = 553) vs. Senior Ranks, Dataset 5 (n = 266)					
1. Baseline model; no equality constraints	534.05	245			
2. Measurement model; all factor loadings constrained equal	543.84	253	9.79	8	*ns*
3. Structural model; all regression paths constrained equal	555.87	262	21.82	17	*ns*

Note. $\chi^2\Delta$ = difference in χ^2 values between models; Δdf = difference in the number of degree of freedom between models.

To assess whether organizational tenure might moderate the relationships among constructs, participants with five years of service or less were assigned to the Novice group whereas those with more than five years of service were assigned to the Skilled group. As done previously with rank, the full structural equation model was estimated within both groups simultaneously, and the χ^2 value generated by this test was used as a

baseline value against which all subsequently specified invariance models were compared. Table 16 presents results that are similar to those reported in Table 15, except that here, there are statistical evidences of moderation based on tenure (or years of military service). Specifically, the results show that in three of five datasets, the path between rank and ethical attitudes did not operate equivalently across groups. In the Novice group, the standardized regression coefficient ranged from -.01 (*ns*) to .10 (*ns*) whereas in the Skilled group, it ranged from .32 ($p < .01$) to .39 ($p < .01$). All other two- and three-way interaction effects were either non-significant or significant in only one dataset. Thus, in one case as in the other, these results are interpreted as null effects.

Table 16

Chi-Square (χ^2) *Values for Tests of Multigroup Moderation (Novice vs. Skilled)*

Model description	χ^2	*df*	$\chi^2\Delta$	Δ *df*	Statistical significance
Novice, Dataset 1 (n = 322) vs. Skilled, Dataset 1 (n = 497)					
1. Baseline model; no equality constraints	527.76	245			
2. Measurement model; all factor loadings constrained equal	536.83	253	9.07	8	*ns*
3. Structural model; all regression paths constrained equal	566.21	262	38.45	17	.01
(Model A) Path between social climate and psychological distress constrained equal	539.63	254	11.87	9	*ns*
(Model B) Model A and path between social climate and ethical attitudes constrained equal	543.69	255	15.93	10	*ns*
(Model C) Model B and path between rank and ethical attitudes constrained equal	556.19	256	28.43	11	.01
(Model D) Model B and path between combat exposure and psychological distress constrained equal	543.85	256	16.09	11	*ns*
(Model E) Model D and path between combat exposure and ethical attitudes constrained equal	544.59	257	16.83	12	*ns*
(Model F) Model E and path between number of UN/NATO tours and psychological distress constrained equal	549.41	258	21.65	13	*ns*
(Model G) Model F and path between interaction construct and psychological distress constrained equal	549.41	259	21.65	14	*ns*
(Model H) Model G and path between interaction construct and ethical attitudes constrained equal	552.78	260	25.02	15	.05

Table 16 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δ *df*	Statistical significance
(Model I) Model G and path between psychological distress and ethical attitudes constrained equal	550.89	260	23.13	15	*ns*
Novice, Dataset 2(n = 314) vs. Skilled, Dataset 2 (n =505)					
1. Baseline model; no equality constraints	493.18	245			
2. Measurement model; all factor loadings constrained equal	503.49	253	10.31	8	*ns*
3. Structural model; all regression paths constrained equal	521.80	262	28.62	17	.05
(Model A) Path between social climate and psychological distress constrained equal	504.90	254	11.72	9	*ns*
(Model B) Model A and path between social climate and ethical attitudes constrained equal	508.61	255	15.43	10	*ns*
(Model C) Model B and path between rank and ethical attitudes constrained equal	511.69	256	18.51	11	*ns*
(Model D) Model C and path between combat exposure and psychological distress constrained equal	512.24	257	19.06	12	*ns*
(Model E) Model D and path between combat exposure and ethical attitudes constrained equal	512.29	258	19.11	13	*ns*
(Model F) Model E and path between number of UN/NATO tours and psychological distress constrained equal	516.90	259	23.72	14	.05
(Model G) Model E and path between interaction construct and psychological distress constrained equal	512.35	259	19.17	14	*ns*
(Model H) Model G and path between interaction construct and ethical attitudes constrained equal	515.79	260	22.61	15	*ns*
(Model I) Model H and path between psychological distress and ethical attitudes constrained equal	517.07	261	23.89	16	*ns*
Novice, Dataset 3 (n = 323) vs. Skilled, Dataset 3 (n = 496)					
1. Baseline model; no equality constraints	493.69	245			
2. Measurement model; all factor loadings constrained equal	502.40	253	8.71	8	*ns*
3. Structural model; all regression paths constrained equal	520.47	262	26.78	17	*ns*
Novice, Dataset 4 (n = 318) vs. Skilled, Dataset 4 (n = 501)					
1. Baseline model; no equality constraints	518.24	245			
2. Measurement model; all factor loadings constrained equal	524.68	253	6.44	8	*ns*
3. Structural model; all regression paths constrained equal	549.77	262	31.53	17	.05
(Model A) Path between social climate and psychological distress constrained equal	526.14	254	7.90	9	*ns*
(Model B) Model A and path between social climate and ethical attitudes constrained equal	528.59	255	10.35	10	*ns*
(Model C) Model B and path between rank and ethical attitudes constrained equal	542.44	256	24.20	11	.05
(Model D) Model B and path between combat exposure and psychological distress constrained equal	528.96	256	10.72	11	*ns*
(Model E) Model D and path between combat exposure and ethical attitudes constrained equal	529.18	257	10.94	12	*ns*

Table 16 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δ *df*	Statistical significance
(Model F) Model E and path between number of UN/NATO tours and psychological distress constrained equal	530.22	258	11.98	13	*ns*
(Model G) Model F and path between interaction construct and psychological distress constrained equal	530.38	259	12.14	14	*ns*
(Model H) Model G and path between interaction construct and ethical attitudes constrained equal	534.24	260	16.00	15	*ns*
(Model I) Model H and path between psychological distress and ethical attitudes constrained equal	536.47	261	18.23	16	*ns*
Novice, Dataset 5 (n = 329) vs. Skilled, Dataset 5 (n = 490)					
1. Baseline model; no equality constraints	499.43	245			
2. Measurement model; all factor loadings constrained equal	510.78	253	11.35	8	*ns*
3. Structural model; all regression paths constrained equal	537.09	262	37.66	17	.01
(Model A) Path between social climate and psychological distress constrained equal	514.04	254	14.61	9	*ns*
(Model B) Model A and path between social climate and ethical attitudes constrained equal	515.41	255	15.98	10	*ns*
(Model C) Model B and path between rank and ethical attitudes constrained equal	527.01	256	27.58	11	.01
(Model D) Model B and path between combat exposure and psychological distress constrained equal	515.82	256	16.39	11	*ns*
(Model E) Model D and path between combat exposure and ethical attitudes constrained equal	516.61	257	17.18	12	*ns*
(Model F) Model E and path between number of UN/NATO tours and psychological distress constrained equal	519.85	258	20.42	13	*ns*
(Model G) Model F and path between interaction construct and psychological distress constrained equal	519.92	259	20.49	14	*ns*
(Model H) Model G and path between interaction construct and ethical attitudes constrained equal	523.70	260	24.27	15	*ns*
(Model I) Model H and path between psychological distress and ethical attitudes constrained equal	525.94	261	26.51	16	.05

Note. $\chi^2\Delta$ = difference in χ^2 values between models; Δdf = difference in the number of degree of freedom between models.

Finally, to assess the possible effect of operational experience on the relationships among constructs, participants with one UN/NATO tour were assigned to the Inexperienced group while those with more than one operational deployment were assigned to the Experienced group. Next, as with rank and years of service, a series of multigroup moderation tests were performed; results are reported in Table 17.

Table 17

Chi-Square (χ^2) *Values for Tests of Multigroup Moderation (Inexperienced vs. Experienced)*

Model description	χ^2	*df*	$\chi^2\Delta$	Δ *df*	Statistical significance
Inexperienced, Dataset 1 (n = 447) vs. Experienced, Dataset 1 (n = 372)					
1. Baseline model; no equality constraints	527.76	245			
2. Measurement model; all factor loadings constrained equal	539.15	253	11.39	8	*ns*
3. Structural model; all regression paths constrained equal	557.86	262	30.10	17	.05
(Model A) Path between social climate and psychological distress constrained equal	539.83	254	12.07	9	*ns*
(Model B) Model A and path between social climate and ethical attitudes constrained equal	542.01	255	14.25	10	*ns*
(Model C) Model B and path between rank and ethical attitudes constrained equal	544.37	256	16.61	11	*ns*
(Model D) Model C and path between combat exposure and psychological distress constrained equal	546.80	257	19.04	12	*ns*
(Model E) Model D and path between combat exposure and ethical attitudes constrained equal	549.02	258	21.26	13	*ns*
(Model F) Model E and path between years of service and ethical attitudes constrained equal	550.32	259	22.56	14	*ns*
(Model G) Model F and path between interaction construct and psychological distress constrained equal	552.52	260	24.76	15	*ns*
(Model H) Model G and path between interaction construct and ethical attitudes constrained equal	556.67	261	28.91	16	.05
(Model I) Model G and path between psychological distress and ethical attitudes constrained equal	554.19	261	26.43	16	.05
Inexperienced, Dataset 2(n = 450) vs. Experienced, Dataset 2 (n =369)					
1. Baseline model; no equality constraints	521.17	245			
2. Measurement model; all factor loadings constrained equal	529.28	253	8.11	8	*ns*
3. Structural model; all regression paths constrained equal	545.65	262	24.48	17	*ns*
Inexperienced, Dataset 3 (n = 446) vs. Experienced, Dataset 3 (n = 373)					
1. Baseline model; no equality constraints	530.36	245			
2. Measurement model; all factor loadings constrained equal	543.85	253	13.49	8	*ns*
3. Structural model; all regression paths constrained equal	558.94	262	28.58	17	.05
(Model A) Path between social climate and psychological distress constrained equal	544.24	254	13.88	9	*ns*
(Model B) Model A and path between social climate and ethical attitudes constrained equal	546.75	255	16.39	10	*ns*

Table 17 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δ *df*	Statistical significance
(Model C) Model B and path between rank and ethical attitudes constrained equal	548.32	256	17.96	11	*ns*
(Model D) Model C and path between combat exposure and psychological distress constrained equal	551.41	257	21.05	12	.05
(Model E) Model C and path between combat exposure and ethical attitudes constrained equal	548.50	257	18.14	12	*ns*
(Model F) Model E and path between years of service and ethical attitudes constrained equal	549.19	258	18.83	13	*ns*
(Model G) Model F and path between interaction construct and psychological distress constrained equal	551.54	259	21.18	14	*ns*
(Model H) Model G and path between interaction construct and ethical attitudes constrained equal	554.55	260	24.19	15	*ns*
(Model I) Model H and path between psychological distress and ethical attitudes constrained equal	555.99	261	25.63	16	*ns*
Inexperienced, Dataset 4 (n = 450) vs. Experienced, Dataset 4 (n = 369)					
1. Baseline model; no equality constraints	532.07	245			
2. Measurement model; all factor loadings constrained equal	541.81	253	9.74	8	*ns*
3. Structural model; all regression paths constrained equal	568.68	262	36.61	17	.01
(Model A) Path between social climate and psychological distress constrained equal	542.39	254	10.32	9	*ns*
(Model B) Model A and path between social climate and ethical attitudes constrained equal	547.47	255	15.40	10	*ns*
(Model C) Model B and path between rank and ethical attitudes constrained equal	554.41	256	22.34	11	.05
(Model D) Model B and path between combat exposure and psychological distress constrained equal	551.46	256	19.39	11	*ns*
(Model E) Model D and path between combat exposure and ethical attitudes constrained equal	552.16	257	20.09	12	*ns*
(Model F) Model E and path between years of service and ethical attitudes constrained equal	555.01	258	22.94	13	.05
(Model G) Model E and path between interaction construct and psychological distress constrained equal	554.51	258	22.44	13	.05
(Model H) Model E and path between interaction construct and ethical attitudes constrained equal	557.18	258	25.11	13	.05
(Model I) Model E and path between psychological distress and ethical attitudes constrained equal	554.36	258	22.29	13	*ns*
Inexperienced, Dataset 5 (n = 446) vs. Experienced, Dataset 5 (n = 373)					
1. Baseline model; no equality constraints	532.80	245			
2. Measurement model; all factor loadings constrained equal	544.26	253	11.46	8	*ns*
3. Structural model; all regression paths constrained equal	567.73	262	34.93	17	.01
(Model A) Path between social climate and psychological distress constrained equal	545.16	254	12.36	9	*ns*

Table 17 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δ *df*	Statistical significance
(Model B) Model A and path between social climate and ethical attitudes constrained equal	547.41	255	14.61	10	*ns*
(Model C) Model B and path between rank and ethical attitudes constrained equal	556.22	256	23.42	11	.05
(Model D) Model B and path between combat exposure and psychological distress constrained equal	550.95	256	18.15	11	*ns*
(Model E) Model D and path between combat exposure and ethical attitudes constrained equal	552.40	257	19.60	12	*ns*
(Model F) Model E and path between years of service and ethical attitudes constrained equal	557.72	258	24.92	13	.05
(Model G) Model E and path between interaction construct and psychological distress constrained equal	554.22	258	21.42	13	*ns*
(Model H) Model G and path between interaction construct and ethical attitudes constrained equal	555.04	259	22.24	14	*ns*
(Model I) Model H and path between psychological distress and ethical attitudes constrained equal	556.40	260	23.60	15	*ns*

Note. $\chi^2\Delta$ = difference in χ^2 values between models; Δdf = difference in the number of degree of freedom between models.

Here again, in two of the five multiply imputed datasets (datasets 4 and 5), the path between rank and ethical attitudes was moderated by group membership such that in the group with the least amount of operational experience, this path was stronger (β ranged from .33 to .37, $p < .01$) than in the group with the most operational experience (β ranged from .18 to .21, $p < .01$). Conversely, the path between years of service and ethical attitudes was stronger in the group with more than one deployment (β = .23, $p < .01$) than in the group with one operational deployment (β ranged from -.01 to .03, *ns*). As far as the effects of social climate are concerned, three sets of results are worthy of note. *First*, despite the fact that the regression coefficients corresponding to the paths between social climate and the two outcome variables seem different across samples (see Figures 11 and 12), the $\chi^2\Delta$ tests presented in Table 17 (see Models A and B for all five datasets) attest that they are statistically equal. *Second*, while admittedly exceptional relative to results

based on the other three datasets, analyses based on datasets 1 and 4 suggest that operational experience might moderate the relationship between the interaction construct and ethical attitudes, such that in the least experienced group, a social climate characterised by a shared ethos, strong cohesion, high morale and good leadership, might amplify the adverse influence of combat exposure on ethical attitudes (see Figure 11). Lastly, contrary to expectations, operational experience did not moderate the path between the interaction construct and psychological distress (see Models G in Table 17); in both samples, this path was non-significant.

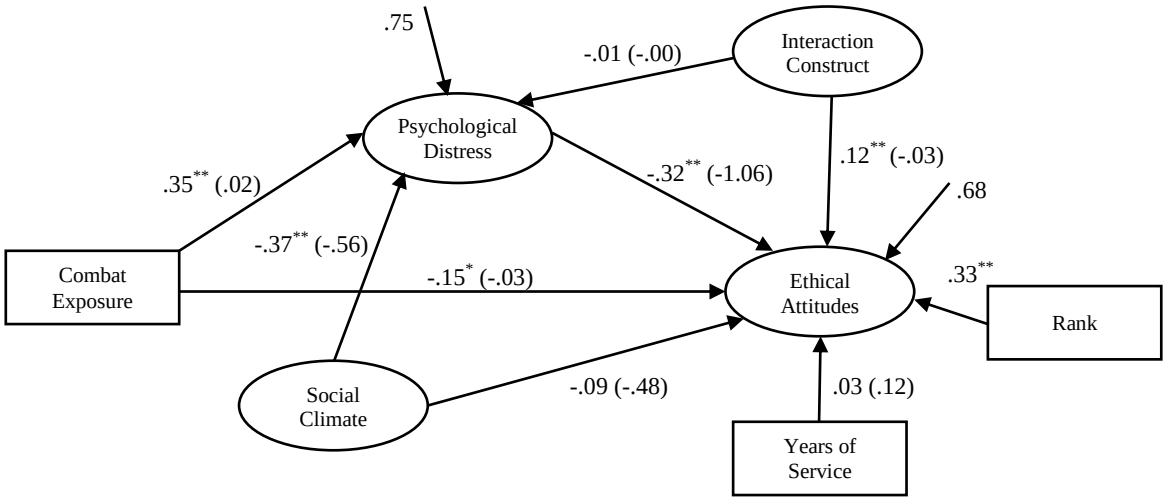

Figure 11. Parameter coefficients for the group with one operational deployment. Analyses are based on dataset 4. Numbers in brackets correspond to unstandardized coefficients.

$^{*}p < .05$. $^{**}p < .01$.

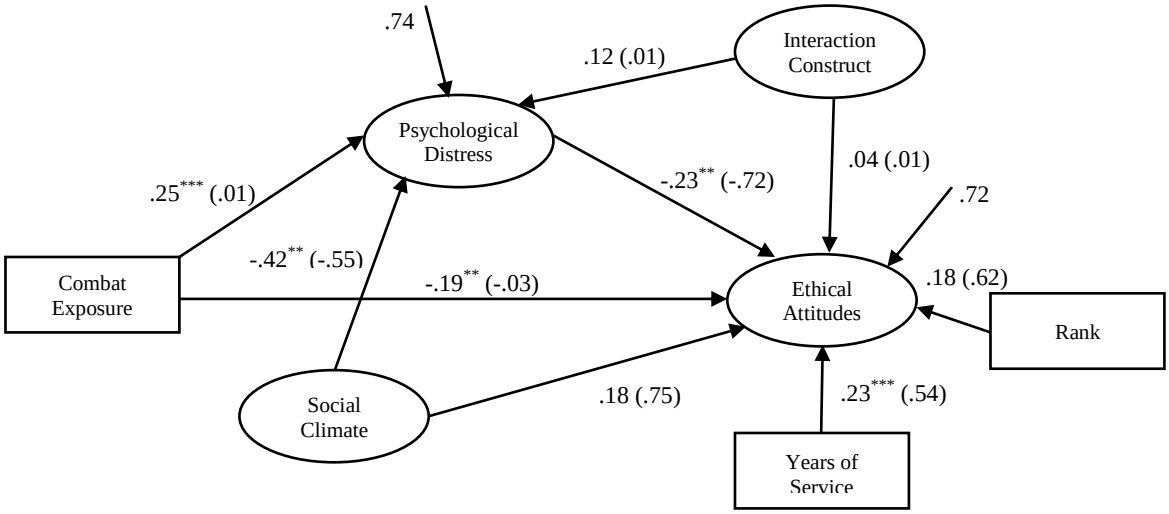

Figure 12. Parameter coefficients for the group with more than one operational deployment. Analyses are based on dataset 4. Numbers in brackets correspond to unstandardized coefficients.

$^{**}p < .01$. $^{***}p < .001$.

Figure 13 shows graphically the significant interaction of social climate with combat exposure in relation to the ethical attitudes of personnel with only one operational deployment. In general, it may be seen that ethical attitudes decreased as combat exposure increased, though this reduction was much greater for respondents with positive (high) social climate perceptions than for those with negative (low) social climate perceptions.

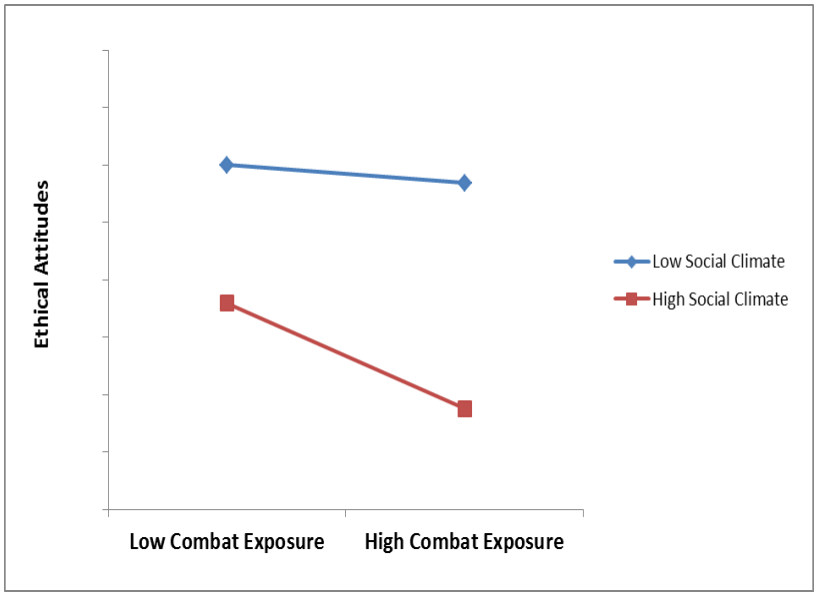

Figure 13. Interaction of social climate with combat exposure in relation to the ethical attitudes of personnel with one operational deployment. Low levels of combat exposure are one standard deviation below the mean whereas high levels of combat exposure are one standard deviation above the mean. Numbers associated with each tick marks are not presented in this figure as they have no practical meaning when analyses are based on latent constructs and unstandardized control variables are included in the model.

Discussion

This study was designed to achieve three complementary objectives. The first objective was to evaluate whether the findings of Study 1 could be replicated in a completely different sample of Canadian soldiers deployed in the same active theatre of operation. The second goal, which was also the main focus of this second study, was to evaluate whether a positive social climate could attenuate the effects of combat exposure on psychological distress and ethical attitudes. The third objective was to investigate whether the relationships among study variables would vary as a function of military background (i.e., rank, years of service, and number of deployments), with a focus on the direct and interactive effects of social climate perceptions.

In order to achieve these goals, five competing models were generated, each model representing a different process through which combat exposure could theoretically influence one's ethical attitudes, and, in three cases, through which social climate perceptions could influence psychological distress and ethical attitudes. Prior to testing and comparing the fit of these five competing models, the computation of descriptive statistics and correlations among variables revealed that Study 2 participants had many points in common with those of Study 1: (a) they ran into a similar number of combat stressors, (b) experienced similar symptoms of distress in the four weeks preceding survey administration, and (c) displayed the same pattern of responding to the ethics-related statements that were presented to them in the survey (see Appendix H for details). Specifically, Study 2 participants exhibited the same apparent tendency to give their least ethically acceptable ratings to items related to torture and their most ethically

acceptable ratings to statements related to treatment of non-combatants. As for the bivariate correlations among measured variables, Study 2 results were nearly identical to those of Study 1, suggesting that these correlational patterns were not coincidental.

With regards to combat exposure and its relationship with ethical attitudes, Study 2 results paint a slightly different picture than those of Study 1. Recall that the main finding of Study 1 was that combat exposure and ethical attitudes were related, but that this relationship was fully mediated by psychological distress. In Study 2, it was found that combat exposure may also have a direct effect on ethical attitudes, though this effect is seemingly small, signalling that much of the variation in ethical attitudes may still be attributed to anxiety and depressive symptoms. As far as social climate perceptions are concerned, the results lend further support to the already sizeable research literature suggesting that positive work group factors (psychological climate) lead to or are associated with psychological adjustment (see Parker et al., 2003, for a meta-analytic review). However, in the sample as a whole, there were no indications that positive social climate perceptions could moderate the relationships between combat exposure and the two outcome variables, namely psychological distress and ethical attitudes. Therefore, all that may be cautiously concluded at this point is that a positive appraisal of social factors at work can possibly mitigate the indirect effect of combat exposure on ethical attitudes by reducing psychological distress, and this, no matter how frequently a soldier has been exposed to battlefield stressors. This finding, though unexpected, is not fully at odds with prior research on the stress buffering effects of work group factors such as social support. Indeed, while the evidence for the direct effects of work stressors and social support on

strain is quite strong, and supported by credible studies (e.g., Viswesvaran, Sanchez, & Fisher, 1999), the evidence for an "across-the-board" interaction effect is less consistent (Bradley, 2007; Dormann & Zapf, 1999; Sonnentag & Frese, 2003).

Finally, in seeking evidence of moderation based on ranks, years of service, and number of UN/NATO tours, three unexpected results were uncovered. *First*, in all cases, there was a preponderance of evidence suggesting that the process through which combat exposure affects the ethical attitudes of soldiers is group-invariant, which, incidentally, lends further credibility to the conclusions drawn from results based on the whole sample. Amongst these results, the failure to find any significant interaction between combat exposure and number of deployments specifically suggests that having a history of multiple tours is unlikely to systematically promote (or hinder) resilience during subsequent operational assignments. Two factors might have contributed to producing this unexpected finding. The first factor is that the comparatively short duration of Canadian deployments might not provide a suitable context for the development and consolidation of new coping skills. The second factor is that the occasionally long length of time between deployments might cause newly developed coping skills to fade away, thus forcing soldiers to re-learn how to cope with deployment stressors each time they participate in a new operation. Whatever the reason, though, this finding may be viewed as support for the appropriateness of the Canadian Forces' personnel tempo policy for international operations, which outlines the optimum duration of operational assignments (six to nine months) and the minimum length of time between two consecutive deployments (no more than one deployment in a three-year cycle).

Second, except in one group, there was no indication that positive social climate perceptions could attenuate the adverse effects of combat exposure on psychological distress and ethical attitudes. In the one group where there were some indications that social climate perceptions could possibly influence the relationships between combat exposure and ethical attitudes, the direction of the interactive effect was in the opposite direction to what was initially hypothesized. Indeed, the negative effect of combat exposure on the ethical attitudes of inexperienced soldiers was significantly stronger among those with positive social climate perceptions than among those with negative social climate perceptions. Though unexpected, and needing replication in another study, this finding is consistent with empirical research and other scholarly articles in the area of intergroup relations, notably with writings on or related to intergroup threat theory (Stephan, Stephan, & Gudykunst, 1999; Stephan, Ybarra, & Morrison, 2009). Recall that one central tenet of this theory is that social prejudice and intergroup conflicts are triggered by the feelings of anxiety and apprehension people experience when they perceive that another group is in a position to cause them harm, and that strong ingroup identification and lack of personal experience with the outgroup, can increase the salience of threats, which can in turn lead to cognitive biases and negative feelings (e.g., frustration, anger, hostility) that make violence against the outgroup more likely and easier to condone. Thus, in light of this theory, it makes sense that the negative effects of combat exposure on ethical attitudes were found to be stronger (at least in datasets 1 and 4) among soldiers with little operational experience and positive social climate perceptions. In the context of this study, having little operational experience may be

interpreted as having little experience dealing with Afghans, and the reporting of positive social climate perceptions may be expected to be associated strong ingroup identification.

Third, in nearly all multiply imputed datasets[21], the effects of variables related to military experience (i.e., rank, years of service, and number of UN/NATO tours) on the ethical attitudes of soldiers were equivalent across groups. In all evaluated groups, these effects were positive, suggesting that any group of soldiers can benefit from training and experiences that emphasize ethical decision-making. In the Canadian military, this kind of training is incorporated into career courses leading to promotions, and individual experience in dealing with ethical issues is acquired through time and appointments to positions of responsibility.

This study extends previous research in two important ways. *First*, the finding that at least two-third of the total effect of combat exposure on ethical attitudes is either direct or associated with some other factors than psychological distress, and that 72% of the variance in ethical attitudes is unexplained by psychological symptoms of strain such as anxiety and depressive symptoms (nor by any other variables in the model), highlights the complexity of the issue−this is more than just a mental health problem−and indirectly calls for the further complexification of the moral injury model proposed by clinicians and mental health researchers (e.g., Litz et al., 2009; Dresher et al., 2011). In this regards, the intergroup threat theory discussed earlier, as well as the broader social psychology literature on intergroup relations, appear to be particularly relevant. Together, they shed a

[21] In seeking evidence of moderation based on years of service and number of UN/NATO deployments specifically, it was occasionally found that the path between rank and ethical attitudes was not operating equivalently across groups. That said, in the case of analyses based on tenure, little practical (or theoretical) meaning can be attributed to these results because of severe restriction in the range of the predictor variable (rank) for novice personnel−most of them were in the same rank category.

different, but complementary light on the subject (i.e., the influence of combat exposure on soldiers' ethical attitudes), and provide ideas to improve the moral resilience of soldiers that have not yet been considered by those responsible for the generation of ethical warriors−at least not in Canada.

Second, though this study was not intended to be a test of intergroup threat theory in *in extremis* environments, its results (notably the finding that the association between combat exposure and ethical attitudes is possibly stronger among soldiers with little operational experience and positive social climate perceptions) are generally consistent with that theory and thus indirectly attest to its relevance for predicting/understanding soldiers' reactions during combat operations. Therefore, given the overlap between this theory and the results reported here, the present research may be regarded as the first study to demonstrate that intergroup threat theory might have direct predictive power in a combat environment. Previous writing on the military relevance of this theory had established a parallel between its various components and the results of U.S. studies conducted during peacekeeping deployments (see Boniecki & Britt, 2003), but it's predictive power, though expected, had never been tested in a combat environment where realistic and symbolic threats are real, not only perceived.

Notwithstanding the contribution that Study 2 seems to be making to our understanding of soldiers' reactions to combat exposure, it is important that its limitations be acknowledged along with those of Study 1. These limitations will be addressed in the General Discussion section of this dissertation (which is presented next) together with a presentation of some practical implications of the results, and recommendations for future

research. Of course, all of this discussion will be preceded by the summary of the key findings generated by the two studies.

General Discussion

Summary of Key Findings

Studies conducted among U.S. and Canadian military personnel deployed to southwest Asia have shown that soldiers involved in counter-insurgency operations can be confronted with morally ambiguous situations (e.g., choosing between troops safety and the rules of engagement) where decisions must be made quickly without much time for deliberation, or reference to authorities (MHAT IV, 2006; MHAT V, 2008). This is not to say, however, that they must always act on impulse (or moral intuition) and that civilian models of cognitive ethical decision-making are inappropriate to explain (or study) their war-zone behaviours. In fact, even though some front-line soldiers may sometimes have to make split-second decisions that can have grave moral implications, most military personnel are employed in support roles that bear much resemblance with civilian jobs. In these circumstances, Rest's (1986) four stage model of ethical decision-making (see Literature Review for details) posits that the likelihood that a person facing an ethical dilemma will choose a morally acceptable course of action is heavily determined by the strength of his or her moral intentions, that is, by the extent to which that person is motivated to engage in a morally acceptable behaviours. In circumstances where soldiers believe that they have complete control over the choices they make, the theory of planned behaviour (Ajzen, 1991) holds that the main factor influencing their behavioural intentions is their attitudes towards their behavioural options. Unlike personal values, which are relatively stable and which transcend specific situations, these attitudes are subject to change if given a substantial stimulus.

Judging by the rates of combat stress casualties and other mental health difficulties experienced by soldiers engaged in or returning from combat (see Campise, Geller, & Campise, 2006, for a brief historical review), it seems that few contextual stimuli have a greater intensity than that of battlefield stressors. Paradoxically, however, the process through which combat exposure could possibly affect the ethical attitudes (and behaviours) of soldiers has not been extensively studied, and the few empirical studies that have been formally published on this subject are plagued by so many limitations (e.g., they did not account for the joint influence of other important variables or unintentionally increased the probability of making a type II error by transforming a continuous outcome measure into a dichotomous variable) that no definitive conclusions can be drawn from their results (e.g., Warner et al., 2011). This knowledge gap, together with the great value that many western militaries are putting on the prevention of ethical misconduct during operations, provided the impetus for conducting the two studies reported herein. Together, these two studies have generated an important volume of results, which have already been discussed at length in earlier sections of this dissertation. Here, thus, only the main findings are highlighted along with their imitations and their implications for research and practice.

There are three important findings that have emerged from my research. The *first* is that there are at least two pathways through which combat exposure can affect the ethical attitudes of soldiers, and, indirectly, their behaviours. The first study helped uncover one of these two pathways−the indirect pathway through symptoms of psychological distress−whereas Study 2 helped reaffirm the validity of this finding in

addition to revealing the existence of a direct route connecting the two variables. Collectively, these studies suggest that combat exposure is not only mentally harmful, but also morally toxic. In other words, they show that one does not need to be experiencing clinical symptoms of depression or anxiety to develop attitudes that are at odds with the Law of armed conflict−though experiencing these kinds of symptoms should typically increase the likelihood of this outcome. The *second* most important finding of this whole dissertation is that a social climate characterized by good leadership, high morale, strong cohesion, and a shared ethos can have a direct beneficial effect on mental health, which may, also, indirectly attenuate the toxic influence that combat exposure might have on ethical attitudes. Though expected, this finding makes a unique contribution to the literature by adding yet another positive outcome (i.e., ethical attitudes) to the list of effects associated with work climate perceptions. *Finally*, the failure to find any moderation effects based on rank categories, years of service, and number of deployments attests to the robustness of the main model, and, as discussed earlier, to the appropriateness of the Canadian Forces' policy on personnel tempo.

Strengths and Potential Limitations

The most important limitation of the two studies included in this dissertation is their reliance on cross-sectional data, which precludes any causal inferences from the results and makes it difficult to rule out alternative explanations. Although it would have been much preferable to use a longitudinal (or prospective) design and to collect data over multiple time points, the anonymous nature of the survey, and the reluctance of soldiers to create a personal identification number, made the linkage of pre-deployment and in-

theatre responses to the survey impossible. However, the fact that the ordering of the variables was based on theories (and clinical observations) lends credibility to the directionality implied by the model. Also, the decision to assess soldiers' attitudes *in situ*– where sources of environmental influence that are not directly related to work are restricted−instead of *post hoc* limits the possibility of spurious associations due to confounding by one or more covariates (e.g., reintegration difficulties simultaneously causing psychological distress and resentment towards Afghans).

The second most important limitation was the use of convenience samples instead of stratified random samples[22]. Although all available soldiers were given an opportunity to complete the survey, only 47% of Task Force 3-09 and 25% of Task Force 1-10 agreed to participate. Due to these modest response rates[23] (and a number of questionnaires with unreliable responses) there is the possibility of selection bias. However, some precautions were taken to lower the probability of bias in the estimation of parameters. First, bootstrap samples were used to establish confidence intervals around the statistical parameters of focal interest. Second, the results were replicated across different samples of reasonably large sizes. Together these two strategies provide some confidence in the generalizability of the results, and the close alignment between sample and population characteristics (as far as ranks and unit types are concerned) further increases that confidence.

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[22] This sampling strategy was selected because it was a comparatively fast and easy way of collecting data on a large number of soldiers in a non-permissive environment. However, one inherent problem of this sampling strategy is that one is never certain whether the findings can be generalized to the broader population from which the sample was drawn.

[23] The average response rate for organizational studies that utilize data collected from individuals is 52.7% with a standard deviation of 20.4 (Baruch & Holtom, 2008). The average response rate for the in-theatre version of the HDO survey is 44% (H. McCuaig-Edge, personal communication, August 28, 2012)

Another important limitation is the possibility of common method bias due to reliance on self-report measures. Instead, it would have been wise to use different kinds of measures, say, for example, an implicit measure of ethical attitudes instead of survey questions, but the operational environment in which the two studies were conducted has restricted the range of possibilities. Thus, to offset this problem, a common-method factor was incorporated in the measurement model of each study and all survey items were carefully inspected to avoid any overlap in their wording. These precautions, together with the protection of soldiers' identities with anonymous surveys, are likely to have attenuated the severity of the problem, but no one can ever be certain that method effects did not influence results (see Conway & Lance, 2010, for what reviewers should expect from authors regarding common method bias in organizational research).

One last methodological feature that may be regarded as a potential limitation was the use of scales that had never been subjected to psychometric evaluation (e.g., the ethical attitudes scale), or that were created *post hoc* by grouping survey questions that seemed to be reflective of the same underlying latent construct (e.g., the items associated with the social climate measure). Because of this issue, caution must be exercised in the interpretation of the results, especially those relative to the moderator effect of social climate perceptions. However, the fact that all analyses converged in suggesting that these scales are internally consistent, and that their factorial structure is stable and consistent with their intended use, offers some reassurance regarding both the reliability of the results and the validity of inferences drawn from these results.

Implications for Science and Practice

The two studies reported herein have implications for both science and practice. *First*, from a fundamental standpoint, these studies make an important contribution to science by extending our knowledge of the process that can turn normal, ordinary soldiers into perpetrators of malevolent or unethical battlefield behaviours. Up to now, clinicians and researchers had typically attributed ethical lapses in battlefield conduct either to mental health problems or to dysfunctional social dynamics within units (see Zimbardo, 2007, for a comprehensive review of this literature). Here, it was found that combat experiences exert a direct effect on the ethical attitudes of soldiers, indicating that one does not need to be psychologically impaired−or to be working in a dysfunctional unit−to lose his or her "moral bearing" in combat; these kinds of operations appear to be morally toxic in and of themselves.

The finding of a direct and indirect association between battlefield experiences and soldiers' ethical attitudes may have implications beyond military psychology and the study of battlefield conduct. For instance, it is generally accepted, based on some of the writings summarized in the Literature Review section (see Jones, 1991; Trevino, 1986), that the characteristics of an issue (its moral intensity), and those of the work and organizational environment, can influence the quality of an ethical decision. Here, the idea that contextual factors matter was taken one step further by demonstrating that features (e.g., realistic threats) of the environment outside of organizational boundaries can influence ethical decision-making by influencing the ethical attitudes of employees. That being said, the limitations and retrospective nature of the research on which this

conclusion is based point to the need for replication across different samples and militaries, using data collected over time through the use of diverse and psychometrically robust methods, and, above all, for further theoretical work on the mechanisms through which combat exposure influences the ethical attitudes of deployed soldiers. In this regard, it seems that the integrated threat theory discussed earlier could provide an excellent starting point.

As for the "buffering" role of social climate perceptions, the failure to find any significant interaction effects at the individual level (except, perhaps, among those with little operational experience) points to the need for more research in this area, ideally supported by hierarchical linear modeling. Indeed, social climate perceptions may have different effects at different levels of aggregation (soldier-level vs. unit-level). For example, the average social climate of a unit may influence a soldier's mental health and ethical attitudes above and beyond his or her own social climate perceptions. Here, limitations relative to number of groups and to the number of observations nested within each group did not allow for this type of analysis. According to Scherbaum & Ferreter (2009), one needs at least 30 groups of 30 participants to have enough power to detect multilevel effects of a moderate size. In the two studies reported here there were no more than eight units meeting or exceeding this requirement.

Second, from an applied standpoint, the two studies reported here have implications for training and leadership, as well as for policy-making. For instance, given the negative relationship between combat exposure and ethical attitudes it seems important that ethics training be delivered not only before, but also during deployment

because the ethical attitudes of soldiers are likely to decline over time due to repeated exposure to hostilities. Readers wishing to see what this kind of training could look like are referred to Warner et al. (2012) for a practical example of an evidence-based training package designed to be delivered by unit leaders while their unit is deployed.

From a leadership perspective, the large minority of soldiers who endorsed survey statements that were at odds with the Law of armed conflict (see Appendices H and P) should be considered a warning sign that all is not well and that without supervision the war zone scandals that have tarnished the reputation of other countries could also occur in the Canadian military. Soldiers who are employed in isolated locations such as police sub-stations and strong points are probably at greater risk of engaging in unethical behaviours (they are more frequently under fire), and, thus, may require greater supervision (e.g., more frequent visits from senior leaders) than those who work in areas where senior leaders are present.

In any case, initiatives aimed at attenuating symptoms of psychological distress such as anxiety and depressive feelings (e.g., by reducing work-related stressors or improving unit climate) may be expected to alleviate, but not eliminate the risk of battlefield misconduct because the link between combat exposure and ethical attitudes is only partially mediated by psychological distress. Leaders who wish to have a more direct influence on the ethical attitudes of soldiers must find ways to manage combat exposure to ensure that they don't have the same people exposed to live fire over and over again (enhancing the problem). Alternatively they may try to attenuate the risk of unethical battlefield conduct by finding ways to reduce symbolic threat perceptions, which are

known to bring about feelings that make violence against the out-group more likely and easier to justify (see Stephan et al., 2009, for details).

Lastly, the aforementioned recommendations, specifically that relative to ethics training, should be incorporated into policy documents, or, at the very least, in command directives such that in-theatre units may be compelled to conduct battlefield ethics continuation training. If they aren't, the lessons learned through this dissertation will eventually be forgotten, thereby forcing the Canadian military to re-learn them the next time its troops are engaged in large scale combat operations on foreign soils.

Beyond these direct implications for military psychology in general, and military organizations in particular, there are many new research questions that this dissertation raises and that merit further investigation: Does the concept of moral injury have relevance for non-military organizations such as police forces and private security firms? Can the findings reported here provide some insight into why we seem to have perpetual moral (or legal) crises in the financial industry? At the risk of speculation, I propose that the findings reported here (and the concept of moral injury) have relevance to any job requiring risk taking and the upholding of an ethical code. In addition to having a negative effect on mental health, the perception that a threat exists may cause people to be more concerned by self-preservation than by morality (an idea that is reminiscent of and consistent with research on strain as a cause of organizational misconduct; see Greve, Palmer, and Pozner, 2010, for a review), thereby increasing the probability that they will compute attitudes that are at odds with accepted norms of professional conduct.

Conclusion

The topic of battlefield ethics is a difficult subject to study. It takes courage on the part of senior military leaders to dare approve this kind of research, and once a project has been approved, one has to find participants who have enough trust in the organization (and the research team) to openly speak about sensitive and highly controversial topics such as torture and treatment of non-combatants. Notwithstanding these difficulties, it is imperative that we continue research in this field because few human dimensions of operations are as closely linked to mission success as the ethical attitudes and behaviours of deployed soldiers.

Overall, the two studies presented herein provide a first look at the process through which combat exposure can conceivably affect the ethical attitudes of deployed soldiers—a possible determinant of battlefield conduct. The finding that this relationship is partially mediated by symptoms of psychological distress helps to reconcile different points of views about this process (cf. Warner et al., 2012 and Litz et al., 2009), and, thereby, opens up new avenues for research and interventions. As far as the influence of social climate perceptions is concerned, the findings reported here provide evidence that military leaders−who are the artisans of the social climate within their group−have some indirect control over the way their soldiers feel about their ethical obligations.

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Appendix A

From: WARREN.ARMSTRONG@forces.gc.ca
Sent: December-06-11 12:43 PM
To: sebastienblanc@hotmail.com
Subject: SSRRB Applications - TF 3-09 and TF 1-10
Attachments: TF 1-09 ssrrb_proposal_intheatre_HDO.doc; SSRRB Request_TF1-10.doc

Seb,

Attached please find the two SSRRB applications as requested.

TF 3-09 was reviewed and approved under the SSRRB # 831/10.

TF 1-10 was reviewed and approved under the SSRRB # 885/10.

<<TF 1-09 ssrrb_proposal_intheatre_HDO.doc>> <<SSRRB Request_TF1-10.doc>>

Based on a pre deployment administration that was 1 Mar - 31 Mar, and what I calculate to be 1 month
of leave in advance of deploy (April) - I believe that the RIP occurred in May. Thus, 3 months later =
approximately Aug timeframe. The mid tour HDO application does not state when data collection was to
occur.

In the new SSRRB forms, this info is captured, one of the many changes in the SSRRB process.

W.D. Armstrong, M.A.
Major
Researcher
Director Research Operational and Organizational Dynamics, (DROOD 3-5 I Directeur - Dynamique
opérationnelle et organisationnelle (Recherche) - DDOOR 3-5 Chief Military Personnel I Chef du
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Annex E to SOP 1000-9– Social Science Research Review Board (SSRRB)

Director General Military Personnel Research and Analysis (DGMPRA)
Social Science Research Review Board (SSRRB)

In-Service Guide for Technical Approval

Ref: CANFORGEN 145/02 ADMHRMIL 079 UNCLASS 131028Z DEC 02.

The SSRRB's mandate is to conduct a technical review of all opinion and information gathering or social science research projects that involve CF Members and/or Families as well as coordinate all survey and information gathering activities in DND. Aspects reviewed are the project's technical merits, including ethics, design and methodology, relevance and timing. An approval number must be received prior to the collection of any data. In order to conduct a thorough review, the following information is required:

To be completed in full		
Title of survey (English and French if available): Human Dimensions of Operations (HDO) Survey (In-theatre Administration)		
Dates of Data Collection (Start Date – End Date) This iteration of the survey will be administered each time a Battle Group (BG) deploys to Afghanistan. First administration is slated to take place in the Jul-Sep 09 time frame.	Approx # of participants: 2500	
Locations of Data Collection (include all specific locations/bases): Task Force Afghanistan		
Means of Survey (i.e., questionnaire, focus group, interview, etc): Questionnaire		
Personnel Type (i.e., Reg F, Res F, civilians, etc): Reg Force and Primary Reserve personnel		
PRINCIPAL RESEARCHER'S INFORMATION		
Name: Maj G.W. Ivey	E-mail address: Gary.Ivey@forces.gc.ca	
Title: DMPORA 4-2 Operational Effectiveness and Leadership (OEL)	Telephone Number: 613-996-0135	Fax Number: 613-995-2701
L1 INFORMATION		
Name of L1 sponsoring this research: Chief of Land Staff (CLS)	Contact's telephone number:	Contact's e-mail address:
Name of Participant's L1 Research Coord: Maj Seb Blanc	Contact's telephone number: 613-945-0262	Contact's e-mail address: Seb.Blanc@forces.gc.ca

Purpose of the research

This version of the survey is typically administered at mid-point in the deployment, and seeks to measure the human dimensions of operations that can affect individual and group performance on operations.

According to A/CLS (2008), "the HDO Survey is an important means for operational and strategic level commanders to gain insight into the experiences, stressors and ethical issues facing our soldiers on operations".

Note: Once completed, researcher will be required to forward final report and database to the SSRRB

Sponsor (s)

The HDO Survey is sponsored by the CLS (through Land Personnel Concept and Policies).

Note: This is a showstopper. If ECS approval is not granted, we cannot proceed.

Participants

All TF 1-09/TF 5-09 personnel (N = 2,500) deployed to Afghanistan will be asked to participate. This estimate includes both Regular Force and Primary Reserve personnel.

Instrument(s) (copy must be attached)

The in-theatre version of the HDO survey is comprised of the following 6 sections:

The Unit Climate Profile (UCP): The present version of the UCP consists of 11 items assessing how soldiers feel about their unit as a whole, as well as confidence in various levels of leadership in the event of combat. **This short version of the UCP has been previously reviewed by the SSRRB, and authorized for administration within DND/CF (Authorization Number 604/07).**

Morale Climate: The Moral Climate scale was developed by OEL in response to a request from the Army Ethics Coordinator. The scale is broken up into two subsections, each focusing on various aspects of moral climate within units. The first sub-section, consisting of 12 items, pertains to soldiers' attitudes and beliefs regarding the law of armed conflict. Items were either borrowed or adapted from the Mental Health Advisory Team (MHAT VI) Survey or derived from the rules outlined in the CF Code of Conduct. The second section of the scale consists of four items adapted from the MHAT IV Survey, and pertaining to soldiers' reactions to witnessing unlawful combat behaviours. Soldiers are first asked to indicate how likely they would be to report the four infractions, and are subsequently asked to indicate how likely they would be to intervene when witnessing these same four infractions. The Moral Climate Scale is new; accordingly its psychometric properties have yet to be evaluated.

The Signs of Stress Scale: The Kessler (K10) measure is a 10-item self-report questionnaire intended to yield a global measure of "psychological distress" based on questions about the level of anxiety and depressive symptoms in the most recent 4-week period. **This section of the HDO Survey has been previously reviewed by the SSRRB, and authorized for administration within DND/CF (Authorization Number 604/08).**

Stress on Operations: The Stress on Operations scale replaces the Sources of Stress scale which was originally developed for and administered in the context of peace support operations. The new Stress on Operations scale was derived from the MHAT Survey, and measures the number of times people have been exposed to various combat stressors as well as the extent to

which people are concerned by each of these stressors. **A derivative of this scale was authorized for administration within DND/CF (Authorization Number 604/08).**

The Military Values Scale: The Military Values Scale was designed by OEL to assess soldiers' perceptions of how their colleagues uphold the four Canadian military values outlined in the Profession of Arms Manual (duty, loyalty, integrity, courage). Items were derived nearly verbatim from the way the Profession of Arms Manual defines these four military values. **The Military Values Scale has been reviewed by the SSRRB, and authorized for administration within DND/CF (Authorization Number 604/07).**

Background Information. The Background Information component of the HDO survey is used to collect biographical information for group comparison purposes. There are also 5 questions pertaining to Army Ethics Training (items 10 to 14). These questions were included in this last section of the survey because they did not fit anywhere else.

References

Chief of Defence Staff. (2003). *Duty With Honour: The Profession of Arms in Canada.* Ottawa, ON, Canada: Canadian Defence Academy – Canadian Forces Leadership Institute.

Office of the Surgeon Multinational Force-Iraq, & Office of the Surgeon General United States Army Medical Command. (November, 2006). *Mental Health Advisory Team (MHAT) IV Operation Iraqi Freedom 05-07: Final Report.* Retrieved September 11, 2008 from http://www.armymedicine.army.mil/reports/mhat/mhat_iv/mhat-iv.cfm

Procedures

The intent is to use paper and pencil questionnaires, as well as electronic surveys. An email will be sent to all deployed members via the Human Effectiveness Advisor (HEA), asking them to complete the survey. In addition, for those who do not have access to email, the HEA will administer surveys in a group setting. The survey will be translated into French. Analyses will include mainly descriptive statistics, with some ANOVAs and regressions.

Ethical Considerations

The HDO will be administered in compliance with DND/CF regulations governing ethical conduct of research involving human subjects. See the Survey cover sheet and instructions for details.

Researcher's Qualifications

Maj Gary Ivey is a Personnel Selection Officer employed with OEL. He holds an MSc in I/O Psychology.

Annex E to SOP 1000-9– Social Science Research Review Board (SSRRB)

Director General Military Personnel Research and Analysis (DGMPRA)
Social Science Research Review Board (SSRRB)

In-Service Guide for Technical Approval

Ref: CANFORGEN 145/02 ADMHRMIL 079 UNCLASS 131028Z DEC 02.

The SSRRB's mandate is to conduct a technical review of all opinion and information gathering or social science research projects that involve CF Members and/or Families as well as coordinate all survey and information gathering activities in DND. Aspects reviewed are the project's technical merits, including ethics, design and methodology, relevance and timing. An approval number must be received prior to the collection of any data. In order to conduct a thorough review, the following information is required:

To be completed in full		
Title of survey (English and French if available): Human Dimensions of Operations (HDO) Survey - TF 1-10 In-theatre Administration		
Dates of Data Collection (Start Date – End Date) This iteration of the survey will be administered each time a Battle Group (BG) deploys to Afghanistan. This administration is scheduled to begin 15 Jul 10 and last approximately four weeks.	Approx # of participants: 2830	
Locations of Data Collection (include all specific locations/bases): Task Force Afghanistan		
Means of Survey (i.e., questionnaire, focus group, interview, etc): Questionnaire (paper & pencil and electronic)		
Personnel Type (i.e., Reg F, Res F, civilians, etc): Reg Force and Primary Reserve personnel		
PRINCIPAL RESEARCHER'S INFORMATION		
Name: Maj G.W. Ivey	E-mail address: Gary.Ivey@forces.gc.ca	
Title: DROOD 3-2	Telephone Number: 613-996-0135	Fax Number: 613-995-2701
L1 INFORMATION		
Name of L1 sponsoring this research: Chief of Land Staff (CLS)	Contact's telephone number:	Contact's e-mail address:
Name of Participant's L1 Research Coord: Maj Seb Blanc	Contact's telephone number: 613-945-0262	Contact's e-mail address: Seb.Blanc@forces.gc.ca

Purpose of the research

This version of the survey is administered at about the mid-point in the deployment, and seeks to measure the human dimensions of operations that can affect individual and group performance on operations.

According to A/CLS (2008), "the HDO Survey is an important means for operational and strategic level commanders to gain insight into the experiences, stressors and ethical issues facing our soldiers on operations".

Note: Once completed, researcher will be required to forward final report and database to the SSRRB

Sponsor (s)

The HDO Survey is sponsored by the CLS (through G1 Concepts 4).

Note: This is a showstopper. If ECS approval is not granted, we cannot proceed.

Participants

All TF 1-10 personnel (N = 2,830) deployed to Afghanistan will be asked to participate. This estimate includes both Regular Force and Primary Reserve personnel.

Instrument(s) (copy must be attached)

The in-theatre version of the HDO survey is comprised of the following 6 sections:

Moral Climate: The Moral Climate scale was developed by OEL in response to a request from the Army Ethics Coordinator. The scale is broken up into two subsections, each focusing on various aspects of moral climate within units. The first sub-section, consisting of 12 items, pertains to soldiers' attitudes and beliefs regarding the law of armed conflict. Items were either borrowed or adapted from the MHAT VI Survey or derived from the rules outlined in the CF Code of Conduct. The second section of the scale consists of four items adapted from the MHAT IV Survey, and pertaining to soldiers' reactions to witnessing unlawful combat behaviours. Soldiers are first asked to indicate how likely they would be to report the four infractions, and are subsequently asked to indicate how likely they would be to intervene when witnessing these same four infractions. **The most recent version of this scale was been previously reviewed by the SSRRB and authorized for administration within DND/CF (Authorization Number 831/10).**

Stress on Operations: The Stress on Operations scale replaces the Sources of Stress scale which was originally developed for and administered in the context of peace support operations. The new Stress on Operations scale was derived from the MHAT Survey, and measures the number of times people have been exposed to various combat stressors as well as the extent to which people are concerned by each of these stressors. **The most recent version of this scale was been previously reviewed by the SSRRB and authorized for administration within DND/CF (Authorization Number 831/10).**

Ethics Awareness: This section is designed to measure respondents' awareness of Army ethics programmes and policies. **This section of the HDO Survey has been previously reviewed by the SSRRB, and authorized for administration within DND/CF (Authorization Number 878/10).**

The Unit Climate Profile (UCP): The present version of the UCP consists of 11 items assessing how soldiers feel about their unit as a whole, as well as confidence in various levels of leadership in the event of combat. **This short version of the UCP has been previously reviewed by the SSRRB, and authorized for administration within DND/CF (Authorization Number 604/07).**

The Signs of Stress Scale: The Kessler Psychological Distress Scale (K10) is a 10-item self-report questionnaire intended to yield a global measure of "psychological distress" based on questions about the level of anxiety and depressive symptoms in the most recent 4-week period. **This section of the HDO Survey has been previously reviewed by the SSRRB, and authorized for administration within DND/CF (Authorization Number 604/08).**

Operational Mental Health Assessment (OMHA): This scale was adapted from the Marine Health Assessment Team (MHAT) VI survey and included in this iteration on behalf of DGHS. **This scale has been previously reviewed by the SSRRB, and authorized for administration within DND/CF (Authorization Number 825/09).**

Background Information. The Background Information component of the HDO survey is used to collect biographical information for group comparison purposes. **This section of the HDO Survey has been previously reviewed by the SSRRB, and authorized for administration within DND/CF (Authorization Number 831/10).**

References

Chief of Defence Staff. (2003). *Duty With Honour: The Profession of Arms in Canada.* Ottawa, ON, Canada: Canadian Defence Academy – Canadian Forces Leadership Institute.

Office of the Surgeon Multinational Force-Iraq, & Office of the Surgeon General United States Army Medical Command. (November, 2006). *Mental Health Advisory Team (MHAT) IV Operation Iraqi Freedom 05-07: Final Report.* Retrieved September 11, 2008 from http://www.armymedicine.army.mil/reports/mhat/mhat_iv/mhat-iv.cfm

Procedures

The intent is to use paper and pencil questionnaires, as well as electronic surveys. Administration will be coordinated by the deployed Human Effectiveness Advisor (HEA) and conducted through the chain of command. The survey will be translated into French. Analyses will include mainly descriptive statistics, with some ANOVAs and regressions. The OMHA will be analyzed separately by DGHS researchers.

Ethical Considerations

The HDO will be administered in compliance with DND/CF regulations governing ethical conduct of research involving human subjects. See the Survey cover sheet and instructions for details.

Researcher's Qualifications

Maj Gary Ivey is a Personnel Selection Officer employed with OEL. He holds an MSc in I/O Psychology.

Appendix B

PROTECTED B (when completed)

HUMAN DIMENSIONS OF OPERATIONS

In-theatre Administration - Task Force Afghanistan

The purpose of this survey is to provide senior leaders in the Army chain of command with supplemental information on the human factors that can influence the operational readiness/effectiveness of their unit(s). Participation is voluntary; therefore, you do not have to complete this survey. However, in order to provide senior leaders with accurate information, maximum participation is encouraged. Should you decide to participate, please complete all sections of this survey fully and honestly. **You may choose to skip any questions that you are not comfortable with, or that you feel may reveal your identity.**

Thank you for your participation.

This survey has been reviewed by DGMPRA and is authorized for administration within DND/CF in accordance with CANFORGEN 198/08 CMP 084/08 271214Z OCT 08. Authorization number: 831/10

Protecting the Confidentiality of Your Responses

Director Military Personnel Operational Research and Analysis (DMPORA) will protect the confidentiality of your responses to the extent permissible under Canadian Law.

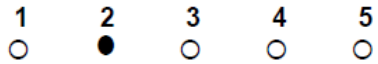
You should be aware that under the Access to Information Act, Canadian citizens are entitled to obtain copies of research reports and research data (including the database pertaining to this project) held in federal government files. Similarly, under the Privacy Act, Canadian citizens are entitled to copies of all information concerning them that is held in Federal government files including research databases. Prior to releasing requested information, the Directorate of Access to Information and Privacy (DAIP) screens the data to ensure that individual identities are not disclosed.

To further safeguard your anonymity and privacy, you should not write your name, service number or personal record identifier anywhere on this questionnaire. Second, you should ensure that any written comments you may offer are sufficiently general that you cannot be identified as the author.

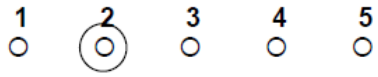
Please read the following instructions before filling out the survey

Each section of this survey has its own instructions. Please read each set of instructions carefully prior to completing each section.

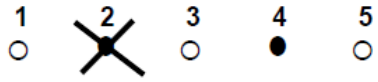
Please respond to the questions by marking the number corresponding to your response.



The bubble can be filled in or circled.



If you change your mind about your responses, please put an X through the incorrect bubble and fill in the correct answer.



Please return **all the pages** of the survey.

Appendix C

Population Characteristics

Study 1 population (Task Force 3-09)

Unit	Rank Category				
	Pte - MCpl	Sgt - CWO	Slt - Capt	Maj - BGen	Total
Joint Task Force Headquarter	238	84	76	71	469
Battle Group	966	146	72	11	1195
Air Wing	144	40	49	16	249
All Sources Information Centre	47	27	13	2	89
Military Police Company	92	19	6	1	118
Health Services	102	26	32	22	182
National Support Element	341	65	24	8	438
Provincial Reconstruction Team	247	59	48	8	362
Operational Mentoring and Liaison Team	98	37	37	10	182
Engineering Support	29	15	1	1	46
Kandahar Unit	2304	518	358	150	3300

Note. Data was provided by Major Jean-Bernard, Army Personnel Research Coordinator on 06 June 2012.

Study 2 population (Task Force 1-10)

Unit	Rank Category				
	Pte - MCpl	Sgt - CWO	Slt - Capt	Maj - BGen	Total
Joint Task Force Headquarter	257	80	76	65	478
Battle Group	986	165	68	12	1231
Air Wing	142	44	55	13	254
All Sources Information Centre	40	25	12	2	79
Military Police Company	122	21	8	2	153
Health Services	117	21	32	15	185
National Support Element	334	79	16	7	436
Provincial Reconstruction Team	232	56	37	6	331
Operational Mentoring and Liaison Team	100	39	38	14	191
Engineering Support	59	37	15	6	117
Kandahar Unit	2389	567	357	142	3455

Note. Data was provided by Major Jean-Bernard, Army Personnel Research Coordinator on 06 June 2012.

Appendix D

STRESS ON OPERATIONS

*Below is a list of situations that may cause soldiers to experience stress. For each of the situations listed below, **TWO** answers are required. First using the 5-point rating scale on the left, please indicate the frequency of which you have experienced any of the following situations **while on your most recent deployment**. Then, using the 5-point rating scale on the right, indicate how much trouble or concern each of these situations have caused you.*

How often have you experienced any of these stressful situations?						How much trouble or concern has this caused you?				
						1 – No trouble or concern 2 – Little trouble or concern 3 – Some trouble or concern 4 – Much trouble or concern 5 – Very much trouble or concern				
①	②	③	④	⑤	1. Being attacked or ambushed.	①	②	③	④	⑤
①	②	③	④	⑤	2. Seeing destroyed homes or villages.	①	②	③	④	⑤
①	②	③	④	⑤	3. Receiving small arms fire.	①	②	③	④	⑤
①	②	③	④	⑤	4. Seeing dead bodies or human remains.	①	②	③	④	⑤
①	②	③	④	⑤	5. Handling or uncovering human remains.	①	②	③	④	⑤
①	②	③	④	⑤	6. Witnessing an accident which resulted in serious injury or death.	①	②	③	④	⑤
①	②	③	④	⑤	7. Witnessing violence with the local population or between ethnic groups.	①	②	③	④	⑤
①	②	③	④	⑤	8. Seeing dead or seriously injured Canadians.	①	②	③	④	⑤
①	②	③	④	⑤	9. Knowing someone seriously injured or killed.	①	②	③	④	⑤
①	②	③	④	⑤	10. Participating in demining operations.	①	②	③	④	⑤
①	②	③	④	⑤	11. Improvised explosive device/booby traps exploding near you.	①	②	③	④	⑤
①	②	③	④	⑤	12. Working in areas that were mined or had improvised explosive devices.	①	②	③	④	⑤
①	②	③	④	⑤	13. Having hostile reactions from local civilians.	①	②	③	④	⑤
①	②	③	④	⑤	14. Disarming civilians.	①	②	③	④	⑤
①	②	③	④	⑤	15. Being in threatening situations where you were unable to respond because of the rules of engagement (ROE).	①	②	③	④	⑤
①	②	③	④	⑤	16. Shooting or directing fire at the enemy.	①	②	③	④	⑤
①	②	③	④	⑤	17. Calling in fire on the enemy.	①	②	③	④	⑤
①	②	③	④	⑤	18. Engaging in hand-to-hand combat.	①	②	③	④	⑤
①	②	③	④	⑤	19. Clearing/searching homes or buildings.	①	②	③	④	⑤
①	②	③	④	⑤	20. Clearing/searching caves or bunkers.	①	②	③	④	⑤
①	②	③	④	⑤	21. Witnessing brutality/mistreatment toward non-combatants.	①	②	③	④	⑤
①	②	③	④	⑤	22. Being wounded/injured.	①	②	③	④	⑤
①	②	③	④	⑤	23. Seeing ill/injured people you were unable to help.	①	②	③	④	⑤
①	②	③	④	⑤	24. Receiving incoming artillery, rocket, or mortar fire.	①	②	③	④	⑤
①	②	③	④	⑤	25. Being directly responsible for the death of an enemy combatant.	①	②	③	④	⑤
①	②	③	④	⑤	26. Observing violations of the Law of Armed Conflict/Geneva Conventions.	①	②	③	④	⑤
①	②	③	④	⑤	27. Being responsible for the death of Canadian or Allied personnel.	①	②	③	④	⑤
①	②	③	④	⑤	28. Having a member of your own unit become a casualty.	①	②	③	④	⑤
①	②	③	④	⑤	29. Had a close call; dud landed near you.	①	②	③	④	⑤

Continued.

How often have you experienced any of these stressful situations? 1 – Never 2 – One time 3 – Two to four times 4 – Five to nine times 5 – Ten or more times		How much trouble or concern has this caused you? 1 – No trouble or concern 2 – Little trouble or concern 3 – Some trouble or concern 4 – Much trouble or concern 5 – Very much trouble or concern	
① ② ③ ④ ⑤	30. Had a close call; a bullet or shrapnel hit a piece of your personal equipment.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	31. Had a close call; equipment shot off your body.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	32. Had a close call; was shot or hit, but protective equipment saved you.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	33. Had a buddy shot or hit who was near you.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	34. Informed unit member/friend of a soldier's death.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	35. Witnessing the verbal abuse of non-combatants.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	36. Witnessing the damage and/or destruction of private property when it was not necessary.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	37. Witnessing a non-combatant being physically hit/kicked when it was not necessary.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	38. Witnessing a detainee being physically hit/kicked when it was not necessary.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	39. Witnessing the unauthorized modification of ROE in order to accomplish the mission.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	40. Witnessing ROE being ignored in order to accomplish the mission.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	41. Witnessing corruption by local nationals, including government officials and security personnel.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	42. Witnessing incompetence by local nationals, including government officials and security personnel.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	43. Having to work under tight deadlines.	① ② ③ ④ ⑤
① ② ③ ④ ⑤	44. Being expected to do more work than is reasonable.	① ② ③ ④ ⑤

Appendix E

SIGNS OF STRESS

*In the **LAST FOUR WEEKS**, about how often…*

	1 None of the time	2 A little of the time	3 Some of the time	4 Most of the time	5 All of the time
1.	did you feel tired-out for no good reason?				① ② ③ ④ ⑤
2.	did you feel nervous?				① ② ③ ④ ⑤
3.	did you feel so nervous that nothing could calm you down?				① ② ③ ④ ⑤
4.	did you feel hopeless?				① ② ③ ④ ⑤
5.	did you feel restless or fidgety?				① ② ③ ④ ⑤
6.	did you feel so restless that you could not sit still?				① ② ③ ④ ⑤
7.	did you feel depressed?				① ② ③ ④ ⑤
8.	did you feel that everything was an effort?				① ② ③ ④ ⑤
9.	did you feel so sad that nothing could cheer you up?				① ② ③ ④ ⑤
10.	did you feel worthless?				① ② ③ ④ ⑤

Appendix F

MORAL CLIMATE

The purpose of this section is to measure the moral climate within your unit. Using the scale beside each question, please fill in the circle that corresponds with your level of agreement/disagreement with the given statement. ***In the context of this survey, the term 'insurgents' refers to illegally armed groups, anti-government forces and terrorists.***

	1 Strongly disagree	2 Disagree	3 Neither agree nor disagree	4 Agree	5 Strongly agree
1.	Torture should not be allowed even if it might save the life of coalition personnel.				① ② ③ ④ ⑤
2.	Torture should not be allowed even if it would lead to important information about insurgents.				① ② ③ ④ ⑤
3.	All non-combatants should be treated with dignity and respect.				① ② ③ ④ ⑤
4.	I would not risk my own safety to help a non-combatant in danger.				① ② ③ ④ ⑤
5.	Verbal threats to non-combatants should be allowed in order to gather important information about insurgents.				① ② ③ ④ ⑤
6.	The Law of Armed Conflict should not be followed when insurgents are not respecting them.				① ② ③ ④ ⑤
7.	All detainees should be treated with dignity and respect.				① ② ③ ④ ⑤
8.	Those who surrender do not need to be protected from the effects of hostilities.				① ② ③ ④ ⑤
9.	I would report breaches to the CF Code of Conduct and Law of Armed Conflict even if it meant I would be subject to retaliation from fellow soldiers.				① ② ③ ④ ⑤
10.	All breaches to the CF Code of Conduct or Law of Armed Conflict should be reported.				① ② ③ ④ ⑤
11.	In conducting operations, I would expose myself to greater risk to minimize harm to civilians and their property.				① ② ③ ④ ⑤
12.	We should provide medical care according to greatest need even if it means that wounded insurgents will receive treatment before wounded Canadian soldiers.				① ② ③ ④ ⑤

Appendix G

BACKGROUND INFORMATION

The following information will be used to view differences between groups, such as rank group or unit. Feel free to skip any question that you are not comfortable answering or that you believe may compromise your confidentiality.

1. What is your current rank category?
   - O Pte-MCpl / OS-MS
   - O Sgt-CWO / PO2-CPO1
   - O Lt-Capt / SLt-Lt(N)
   - O Maj / LCdr and above

2. What is your first official language?
   - O English
   - O French

3. Select the home situation that best describes you.
   - O Married (including common-law)
   - O Married (including common-law) **with dependents** (children or elderly adults)
   - O Single (including divorced, widowed, separated)
   - O Single (including divorced, widowed, separated) **with dependents** (children or elderly adults)

4. What is your status?
   - O Regular
   - O Reservist

5. How many years of service in the CF have you completed?
   - O less than 5
   - O 6 to 10
   - O 11 to 15
   - O 16 to 20
   - O 21 to 25
   - O 26+

6. How many UN/NATO tours have you had in total (including this one)?
   - O 1
   - O 2
   - O 3
   - O 4
   - O 5+

7. Please identify the type of location where you spend the majority of your time.
   - O Non-isolated (e.g., KAF)
   - O Semi-isolated (e.g., forward operating base)
   - O Isolated (e.g., strong point, patrol base, police sub-station, etc.)

8. While employed in-theatre, what percentage of your time do you spend on convoys or patrols?

   _____ %

9. How long have you been in-theatre on this *current* deployment?

   _____ Months

Please provide only one response for each column.

10. Please indicate which unit you belong to. ⇩	11. Please also indicate the sub-unit you belong to. ⇩
O JTF HQ	O Advisors / Cabinet / 99 TAC O Bde Rear (ACOS & JLLO) O Bde TOC (J2, J3, J5, J6, OCC-P, Effects & G9) O Signal Squadron
O MP Coy	N/A
O TFK Engr Regt	O CIED O CMO O SET O ESU
O ASIC	N/A
O NSE	O NSE HQ O Contract Management O Maintenance Coy O Camp Services O S & T Coy
O HSS Unit	O HSS Unit HQ O Role 3 MMU Coy O Role 1 Coy
O TF 3-09 BG	O BG HQ O A Coy O C Coy O D Coy O Admin Coy O Recce Sqn (RCD) O Sabre Sqn (LdSH) O C Bty (1 RCHA) O 11 Fd Sqn (1 CER)
O PRT	O PRT HQ O Stab A Coy O Stab B Coy O CIMIC HQ O CSS
O OMLT	O Corps and 205 Bde HQ O Kandak 1 O Kandak 2 O Kandak 3 O Kandak 4 CS O Kandak 5 CSS
O Air Wing	O Air Wing HQ O CHF (A) O CHUD O TAU O TSE
O Other unit (specify):	O Other sub-unit (specify):

Appendix H

Table 18

Rate of Exposure (experienced at least once) to the Combat Stressors Listed on the HDO Survey Stress on Operations Scale (before multiple imputations)

Potentially Stressful Combat Situations in the HDO Survey Stress on Operations Scale	Calibration Sample (n = 693)		Validation Sample (n = 689)	
	Count	Valid %	Count	Valid %
Being attacked or ambushed.	313	45.5	270	39.5
Seeing destroyed homes or villages.	**441**	**63.9**	**420**	**61.4**
Receiving small arms fire.	304	44.0	287	41.9
Seeing dead bodies or human remains.	357	51.7	320	46.5
Handling or uncovering human remains.	174	25.2	153	22.3
Witnessing an accident which resulted in serious injury or death.	243	35.2	227	33.1
Witnessing violence with the local population or between ethnic groups.	216	31.3	201	29.3
Seeing dead or seriously injured Canadians.	260	37.7	235	34.3
Knowing someone seriously injured or killed.	**516**	**75.1**	**511**	**74.3**
Participating in demining operations.	166	24.2	134	19.6
Improvised explosive device/booby trap exploding near you.	308	44.6	272	39.7
Working in areas that were mined or had improvised explosive devices.	**466**	**67.4**	**437**	**63.5**
Having hostile reactions from local civilians.	**363**	**52.6**	**339**	**49.3**
Disarming civilians.	129	18.7	102	14.9
Being in threatening situations where you were unable to respond because of the rules of engagement (ROE).	219	31.8	179	26.0
Shooting or directing fire at the enemy.	194	28.1	146	21.3
Calling in fire on the enemy.	75	10.9	47	6.9
Engaging in hand-to-hand combat.	36	5.2	8	1.2
Clearing/searching homes or buildings.	258	37.3	225	32.8
Clearing/searching caves or bunkers.	128	18.6	112	16.4
Witnessing brutality/mistreatment toward non-combatants.	93	13.6	58	8.4
Being wounded/injured.	63	9.1	47	6.8
Seeing ill/injured people you were unable to help.	234	34.0	207	30.2
Receiving incoming artillery, rocket, or mortar fire.	**418**	**60.8**	**421**	**61.5**
Being directly responsible for the death of an enemy combatant.	87	12.7	64	9.4
Observing violations of the Law of Armed Conflict/Geneva Conventions.	48	7.0	26	3.8
Being responsible for the death of Canadian or Allied personnel.	23	3.93	6	0.9
Having a member of your own unit become a casualty.	321	46.5	299	43.5
Had a close call; dud landed near you.	236	34.1	218	31.7
Had a close call; a bullet or shrapnel hit a piece of your personal equipment.	90	13.0	73	10.7

Table 18 continued

Potentially Stressful Combat Situations in the HDO Survey Stress on Operations Scale	Calibration Sample (n = 693)		Validation Sample (n = 689)	
	Count	Valid %	Count	Valid %
Had a close call; equipment shot off your body.	17	2.5	18	2.6
Had a close call; was shot or hit, but protective equipment saved you.	29	4.2	23	3.4
Had a buddy shot or hit who was near you.	72	10.4	54	7.9
Informed unit member/friend of a soldier's death.	123	17.8	106	15.4

Note. The five most frequent combat stressors are in bold.

Table 19

Rate of Endorsement (percent Agree or Strongly agree) to the Statements Listed on the Moral Climate scale (before multiple imputations)

Statements on the HDO Survey Ethical Attitudes Scale	Calibration Sample (n = 693)		Validation Sample (n = 689)	
	Count	Valid %	Count	Valid %
Torture should not be allowed even if it might save the life of coalition personnel.	264	38.2	287	41.7
Torture should not be allowed even if it would lead to important information about insurgents.	291	42.1	314	45.6
All non-combatants should be treated with dignity and respect.	548	79.2	549	80.1
I would not risk my own safety to help a non-combatant in danger.	357	52.2	367	53.5
Verbal threats to non-combatants should be allowed in order to gather important information about insurgents.	253	36.7	238	34.6
The Law of Armed Conflict should not be followed when insurgents are not respecting them.	348	50.7	391	57.0
All detainees should be treated with dignity and respect.	434	62.6	455	69.1
Those who surrender do not need to be protected from the effects of hostilities.	472	68.5	496	72.3
I would report breaches to the CF Code of Conduct and Law of Armed Conflict even if it meant I would be subjected to retaliation from fellow soldiers.	331	47.9	370	53.9
All breaches to the CF Code of Conduct or Law of Armed Conflict should be reported.	372	53.9	408	59.9
In conducting operations, I would expose myself to greater risk to minimize harm to civilians and their property.	288	41.6	312	45.4
We should provide medical care according to greatest need even if it means that wounded insurgents will receive treatment before wounded Canadian soldiers.	182	26.3	203	29.6

Appendix I

UNIT CLIMATE

The purpose of this section is to measure morale, cohesion, and other aspects important to military performance. Using the scale beside each question, please fill in the circle that corresponds with your level of agreement /disagreement with the given statement. If a question does not apply, please answer accordingly (N/A).

	1 Strongly disagree	2 Disagree	3 Neither agree nor disagree	4 Agree	5 Strongly agree	
1.	In my unit, we have a shared system of beliefs, values, and attitudes (e.g., integrity, courage, loyalty, etc.) that are valued by and define members of the military.	①	②	③	④ ⑤	
2.	In my unit, there is a collective enthusiasm and persistence in pursuing our assigned goals.	①	②	③	④ ⑤	
3.	We 'stick together', which enhances our ability to achieve our assigned tasks.	①	②	③	④ ⑤	
4.	I have confidence in my abilities as a soldier.	①	②	③	④ ⑤	
5.	My immediate supervisor has effective leadership behaviours.	①	②	③	④ ⑤	
6.	In the event of combat, I have confidence in my Commanding Officer.	①	②	③	④ ⑤	N/A ○
7.	In the event of combat, I have confidence in the CSM/SSM.	①	②	③	④ ⑤	N/A ○
8.	In the event of combat, I have confidence in my company commander.	①	②	③	④ ⑤	N/A ○
9.	In the event of combat, I have confidence in my platoon/troop commander.	①	②	③	④ ⑤	N/A ○
10.	In the event of combat, I have confidence in my section commander.	①	②	③	④ ⑤	N/A ○
11.	In the event of combat, I have confidence in my platoon/troop warrant.	①	②	③	④ ⑤	N/A ○

Table 20

Descriptive Statistics and Correlation Matrix (Study 1, Calibration Sample, Dataset 2)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11
1. Cbt. Exp.	56.28	17.08	34-170	–										
2. Nervous.	2.84	1.26	2-10	.28**	–									
3. Agitation	3.21	1.69	2-10	.29**	.54**	–								
4. Fatigue	3.82	1.72	2-10	.15**	.47**	.53**	–							
5. Neg. Aff.	5.36	2.36	4-20	.26**	.54**	.56**	.55**	–						
6. Reporting	6.83	2.11	2-10	-.18**	-.01	-.15**	-.04	-.14**	–					
7. Torture	6.25	2.43	2-10	-.11**	.00	-.09*	.00	-.07	.48**	–				
8. Gen. Att.	24.53	4.87	7-35	-.11**	-.08*	-.15**	-.06	-.12**	.57**	.47**	–			
9. Rank	1.52	.83	1-4	-.10*	.03	-.05	.01	-.06	.39**	.30**	.37**	–		
10. Yrs. Svc.	2.41	1.51	1-6	-.02	.04	-.07	-.01	-.06	.35**	.21**	.21**	.45**	–	
11. No. Tours	2.06	1.35	1-5	.13**	.06	-.03	-.01	-.01	.18**	.15**	.11**	.29**	.60**	–

Note. n = 693. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Table 21

Descriptive Statistics and Correlation Matrix (Study 1, Calibration Sample, Dataset 3)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11
1. Cbt. Exp.	56.29	17.10	34-170	–										
2. Nervous.	2.84	1.26	2-10	.27**	–									
3. Agitation	3.21	1.70	2-10	.30**	.54**	–								
4. Fatigue	3.82	1.72	2-10	.15**	.47**	.53**	–							
5. Neg. Aff.	5.36	2.38	4-20	.27**	.54**	.56**	.55**	–						
6. Reporting	6.83	2.11	2-10	-.18**	-.01	-.15**	-.04	-.14**	–					
7. Torture	6.25	2.43	2-10	-.11**	.01	-.09*	.01	-.07	.48**	–				
8. Gen. Att.	24.52	4.87	7-35	-.11**	-.08*	-.15**	-.06	-.12**	.57**	.48**	–			
9. Rank	1.54	.85	1-4	-.10**	.03	-.07	.02	-.07	.36**	.29**	.34**	–		
10. Yrs. Svc.	2.40	1.51	1-6	-.02	.04	-.07	-.00	-.06	.37**	.23**	.21**	.44**	–	
11. No. Tours	2.08	1.36	1-5	.11**	.03	-.05	-.03	-.05	.18**	.14**	.09*	.28**	.57**	–

Note. n = 693. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Table 22

Descriptive Statistics and Correlation Matrix (Study 1, Calibration Sample, Dataset 4)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11
1. Cbt. Exp.	56.28	17.08	34-170	–										
2. Nervous.	2.84	1.26	2-10	.28**	–									
3. Agitation	3.21	1.70	2-10	.30**	.54**	–								
4. Fatigue	3.82	1.72	2-10	.15**	.47**	.53**	–							
5. Neg. Aff.	5.36	2.37	4-20	.26**	.54**	.56**	.55**	–						
6. Reporting	6.83	2.11	2-10	-.18**	-.01	-.16**	-.04	-.14**	–					
7. Torture	6.25	2.43	2-10	-.11**	.00	-.09*	.01	-.07	.48**	–				
8. Gen. Att.	24.53	4.87	7-35	-.11**	-.08*	-.15**	-.06	-.12**	.57**	.47**	–			
9. Rank	1.54	.86	1-4	-.11**	.06	-.06	.04	-.06	.38**	.29**	.36**	–		
10. Yrs. Svc.	2.45	1.52	1-6	-.02	.02	-.09*	-.01	-.06	.38**	.24**	.22**	.44**	–	
11. No. Tours	2.08	1.38	1-5	.14**	.05	-.04	-.02	-.03	.19**	.15**	.10*	.27**	.64**	–

Note. n = 693. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Table 23

Descriptive Statistics and Correlation Matrix (Study 1, Calibration Sample, Dataset 5)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11
1. Cbt. Exp.	56.27	17.06	34-170	–										
2. Nervous.	2.84	1.25	2-10	.27**	–									
3. Agitation	3.21	1.70	2-10	.30**	.54**	–								
4. Fatigue	3.82	1.72	2-10	.16**	.47**	.53**	–							
5. Neg. Aff.	5.37	2.39	4-20	.27**	.53**	.56**	.55**	–						
6. Reporting	6.83	2.11	2-10	-.18**	-.01	-.15**	-.04	-.13**	–					
7. Torture	6.24	2.43	2-10	-.11**	.00	-.09*	.00	-.07	.48**	–				
8. Gen. Att.	24.53	4.87	7-35	-.11**	-.08*	-.15**	-.06	-.12**	.57**	.47**	–			
9. Rank	1.51	.83	1-4	-.12**	-.02	-.10**	-.00	-.10**	.38**	.30**	.36**	–		
10. Yrs. Svc.	2.35	1.51	1-6	-.05	.02	-.09*	-.03	-.08*	.36**	.21**	.23**	.47**	–	
11. No. Tours	1.94	1.26	1-5	.14**	.04	-.04	-.02	-.06	.21**	.18**	.14**	.28**	.67**	–

Note. n = 693. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Appendix K

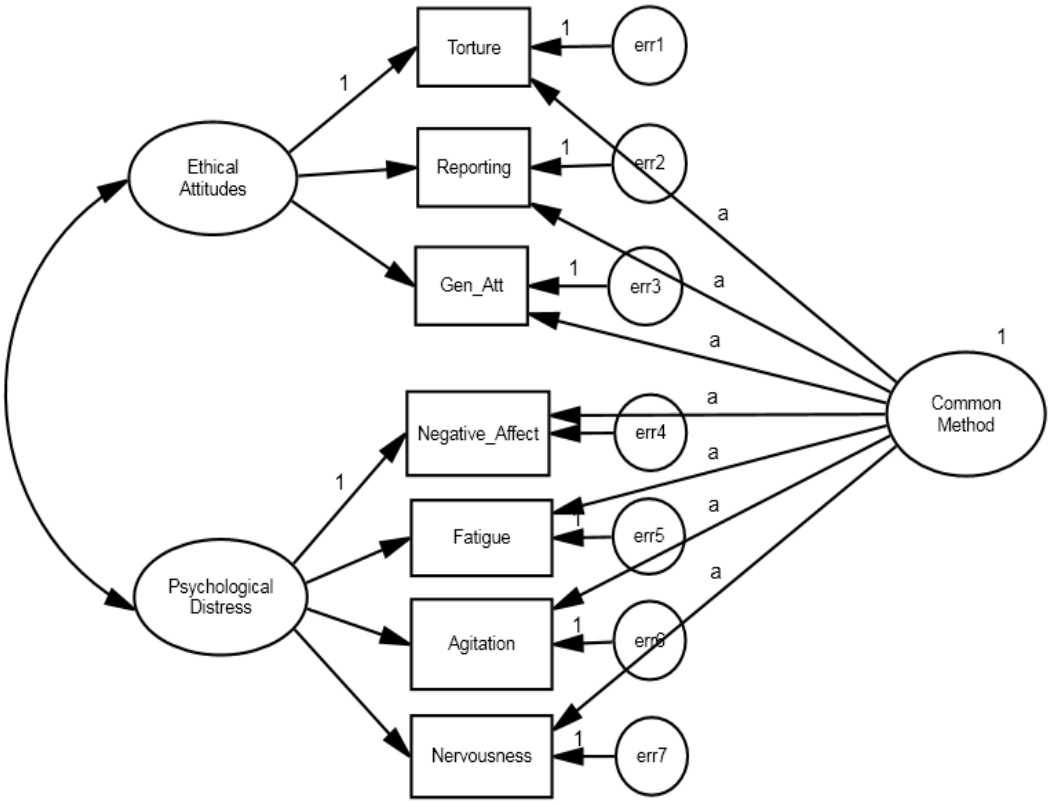


Figure 14. Measurement model for Study 1

Table 24

Fit Indices for the Measurement Model (Study 1)

Model	χ^2 Statistics		RMSEA	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta(1)$
	χ^2	*df*	(90% CI)						
Calibration Sample, Dataset 2									
1. Measurement model w/o method factor	29.58	13	.04 (.02-.06)	*ns*	.99	.98	.61	59.58	
2. Measurement model w/ method factor	20.66	12	.03 (.00-.06)	*ns*	.99	.99	.56	52.66	8.92**
Calibration Sample, Dataset 3									
1. Measurement model w/o method factor	29.18	13	.04 (.02-.06)	*ns*	.99	.98	.61	59.18	
2. Measurement model w/ method factor	19.49	12	.03 (.00-.05)	*ns*	1.00	.99	.56	51.49	9.69**
Calibration Sample, Dataset 4									
1. Measurement model w/o method factor	29.93	13	.04 (.02-.06)	*ns*	.99	.98	.61	59.93	
2. Measurement model w/ method factor	20.40	12	.03 (.00-.06)	*ns*	.99	.99	.56	52.40	9.53**
Calibration Sample, Dataset 5									
1. Measurement model w/o method factor	28.46	13	.04 (.02-.06)	*ns*	.99	.98	.61	58.46	
2. Measurement model w/ method factor	18.93	12	.03 (.00-.05)	*ns*	1.00	.99	.56	50.93	9.53**

Note. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; PNFI = Parsimony Normed Fit Index; AIC = Akaike Information Criterion; $\chi^2\Delta$ = difference in χ^2 values between models.

** $p < .01$

Appendix M

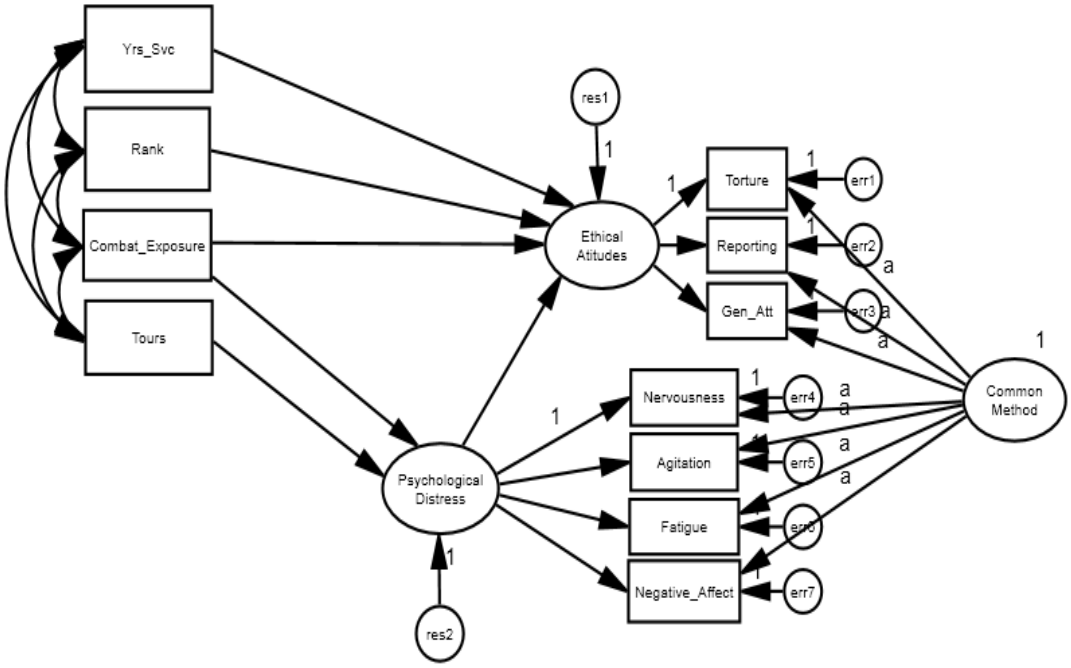


Figure 15. Structural equation model for Study 1

Table 25

Goodness-of-Fit Indices for Model Comparisons (Study 1)

Model	χ^2 Statistics		RMSEA							
	χ^2	*df*	(90% CI)	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta$	Δdf
Calibration Sample, Dataset 2										
1. Partially mediated model	72.65	35	.04 (.03-.05)	*ns*	.98	.97	.62	134.65		
2. Fully mediated model	75.57	36	.04 (.03-.05)	*ns*	.98	.97	.63	135.57	2.92	1
3. Nonmediated model	82.27	36	.04 (.03-.06)	*ns*	.98	.97	.63	142.27	9.62**	1
4. Fully mediated model w/o insignificant paths	77.67	38	.04 (.03-.05)	*ns*	.98	.97	.67	133.67	2.10	2
Calibration Sample, Dataset 3										
1. Partially mediated model	79.05	35	.04 (.03-.06)	*ns*	.98	.97	.61	141.05		
2. Fully mediated model	82.13	36	.04 (.03-.06)	*ns*	.98	.97	.63	142.13	3.08	1
3. Nonmediated model	88.35	36	.05 (.03-.06)	*ns*	.98	.96	.63	148.35	9.30**	1
4. Fully mediated model w/o insignificant paths	87.00	38	.04 (.03-.06)	*ns*	.98	.97	.66	143.00	4.87	2
Calibration Sample, Dataset 4										
1. Partially mediated model	82.07	35	.04 (.03-.06)	*ns*	.98	.97	.61	144.07		
2. Fully mediated model	85.04	36	.04 (.03-.06)	*ns*	.98	.97	.63	145.04	2.97	1
3. Nonmediated model	91.23	36	.05 (.04-.06)	*ns*	.98	.96	.63	151.23	9.16**	1
4. Fully mediated model w/o insignificant paths	88.60	38	.04 (.03-.06)	*ns*	.98	.97	.66	144.60	3.56	2
Calibration Sample, Dataset 5										
1. Partially mediated model	69.64	35	.04 (.03-.05)	*ns*	.99	.98	.62	131.64		
2. Fully mediated model	71.60	36	.04 (.03-.05)	*ns*	.99	.98	.64	131.60	1.96	1
3. Nonmediated model	79.07	36	.04 (.03-.05)	*ns*	.98	.97	.63	139.07	9.43**	1
4. Fully mediated model w/o insignificant paths	79.55	38	.04 (.03-.05)	*ns*	.98	.97	.69	135.55	7.95**	2

Note. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; PNFI = Parsimony Normed Fit Index; AIC = Akaike Information Criterion; $\chi^2\Delta$ = difference in χ^2 values between models. * $p < .05$. ** $p < .01$.

Table 26

Chi-Square (χ^2) Values for Tests of Multigroup Invariance (Study 1)

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
Calibration Sample, Dataset 2 vs. Validation Sample, Dataset 1					
1. Baseline model; no equality constraints	165.31	77			
2. Measurement model; all factor loadings constrained equal	171.22	82	5.91	5	*ns*
3. Structural model; all regression paths constrained equal	188.14	85	22.83	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	174.04	83	8.73	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	187.21	84	21.90	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	174.93	84	9.62	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	177.51	85	12.20	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	187.79	90	22.48	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	179.27	86	13.96	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	179.67	87	14.36	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	183.59	88	18.28	11	*ns*
(Model H) Correlation between rank and combat exposure constrained equal	186.63	89	21.32	12	.05
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	184.64	89	19.33	12	*ns*
Calibration Sample, Dataset 2 vs. Validation Sample, Dataset 2					
1. Baseline model; no equality constraints	150.71	77			
2. Measurement model; all factor loadings constrained equal	156.76	82	6.05	5	*ns*
3. Structural model; all regression paths constrained equal	180.59	85	29.88	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	161.17	83	10.46	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	179.58	84	28.87	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	162.11	84	11.40	7	*ns*

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
(Model D) Path between psychological distress and ethical attitudes constrained equal	164.82	85	14.1	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	173.90	90	23.19	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	166.72	86	16.01	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	168.54	87	17.83	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	173.14	88	22.43	11	.05
(Model H) Correlation between rank and combat exposure constrained equal	168.78	88	18.07	11	*ns*
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	169.00	89	18.29	12	*ns*
Calibration Sample, Dataset 2 vs. Validation Sample, Dataset 3					
1. Baseline model; no equality constraints	154.71	77			
2. Measurement model; all factor loadings constrained equal	160.48	82	5.77	5	*ns*
3. Structural model; all regression paths constrained equal	181.52	85	26.81	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	166.01	83	11.30	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	180.60	84	25.89	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	166.89	84	12.18	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	169.33	85	14.62	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	177.48	90	22.77	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	171.60	86	16.89	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	172.22	87	17.51	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	173.30	88	18.59	11	*ns*
(Model H) Correlation between rank and combat exposure constrained equal	174.84	89	20.13	12	*ns*

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	177.48	90	22.77	13	.05
Calibration Sample, Dataset 2 vs. Validation Sample, Dataset 4					
1. Baseline model; no equality constraints	159.12	77			
2. Measurement model; all factor loadings constrained equal	164.91	82	5.79	5	*ns*
3. Structural model; all regression paths constrained equal	183.33	85	24.21	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	168.07	83	8.95	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	182.43	84	23.31	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	168.93	84	9.81	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	171.12	85	12.00	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	184.10	90	24.98	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	171.64	86	12.52	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	171.99	87	12.87	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	177.65	88	18.53	11	*ns*
(Model H) Correlation between rank and combat exposure constrained equal	183.63	89	24.51	12	.05
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	181.00	89	21.88	12	.05
Calibration Sample, Dataset 2 vs. Validation Sample, Dataset 5					
1. Baseline model; no equality constraints	160.81	77			
2. Measurement model; all factor loadings constrained equal	166.94	82	6.13	5	*ns*
3. Structural model; all regression paths constrained equal	178.56	85	17.75	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	168.04	83	7.23	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	177.63	84	16.82	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	168.94	84	8.13	7	*ns*

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
(Model D) Path between psychological distress and ethical attitudes constrained equal	171.52	85	10.71	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	180.56	90	19.75	13	*ns*
Calibration Sample, Dataset 3 vs. Validation Sample, Dataset 1					
1. Baseline model; no equality constraints	174.78	77			
2. Measurement model; factor loadings constrained equal	181.14	82	6.36	5	*ns*
3. Structural model; regression paths constrained equal	191.34	85	16.56	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	181.86	83	7.18	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	190.17	84	15.39	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	183.00	84	8.22	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	185.44	85	10.66	8	*ns*
4. Structural model; covariance among exogenous variables constrained equal	195.75	90	20.97	13	*ns*
Calibration Sample, Dataset 3 vs. Validation Sample, Dataset 2					
1. Baseline model; no equality constraints	160.18	77			
2. Measurement model; all factor loadings constrained equal	166.68	82	6.50	5	*ns*
3. Structural model; all regression paths constrained equal	182.16	85	21.98	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	168.31	83	8.13	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	180.90	84	20.72	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	169.51	84	9.33	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	172.15	85	11.97	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	180.92	90	20.74	13	*ns*
Calibration Sample, Dataset 3 vs. Validation Sample, Dataset 3					
1. Baseline model; no equality constraints	164.17	77			
2. Measurement model; all factor loadings constrained equal	170.33	82	6.16	5	*ns*

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
3. Structural model; all regression paths constrained equal	183.27	85	19.10	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	172.67	83	8.50	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	182.11	84	17.94	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	173.80	84	9.63	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	176.16	85	11.99	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	184.39	90	20.22	13	*ns*
Calibration Sample, Dataset 3 vs. Validation Sample, Dataset 4					
1. Baseline model; no equality constraints	168.57	77			
2. Measurement model; all factor loadings constrained equal	174.81	82	6.24	5	*ns*
3. Structural model; all regression paths constrained equal	186.15	85	17.58	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	175.74	83	7.17	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	185.02	84	16.45	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	176.84	84	8.27	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	178.91	85	10.34	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	190.61	90	22.04	13	*ns*
Calibration Sample, Dataset 3 vs. Validation Sample, Dataset 5					
1. Baseline model; no equality constraints	170.29	77			
2. Measurement model; all factor loadings constrained equal	176.83	82	6.54	5	*ns*
3. Structural model; all regression paths constrained equal	183.56	85	13.27	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	196.23	91	25.94	14	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	190.64	87	20.35	10	.05
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	187.62	87	17.33	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	189.98	88	19.69	11	.05

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
(Model H) Correlation between rank and combat exposure constrained equal	190.50	88	20.21	11	.05
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	187.86	88	17.57	11	*ns*
Calibration Sample, Dataset 4 vs. Validation Sample, Dataset 1					
1. Baseline model; no equality constraints	176.03	77			
2. Measurement model; factor loadings constrained equal	182.72	82	6.69	5	*ns*
3. Structural model; regression paths constrained equal	195.28	85	19.25	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	183.50	83	7.47	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	194.19	84	18.16	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	184.56	84	8.53	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	187.15	85	11.12	8	*ns*
4. Structural model; covariance among exogenous variables constrained equal	198.12	90	22.09	13	*ns*
Calibration Sample, Dataset 4 vs. Validation Sample, Dataset 2					
1. Baseline model; no equality constraints	161.44	77			
2. Measurement model; all factor loadings constrained equal	168.23	82	6.79	5	*ns*
3. Structural model; all regression paths constrained equal	186.72	85	25.28	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	169.97	83	8.53	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	185.54	84	24.10	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	171.07	84	9.63	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	173.84	85	12.40	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	183.47	30	22.03	13	*ns*
Calibration Sample, Dataset 4 vs. Validation Sample, Dataset 3					
1. Baseline model; no equality constraints	165.43	77			
2. Measurement model; all factor loadings constrained equal	171.92	82	6.49	5	*ns*
3. Structural model; all regression paths constrained equal	187.45	85	22.02	8	.01

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
(Model A) Path between years of service and ethical attitudes constrained equal	174.38	83	8.95	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	186.36	84	20.93	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	175.42	84	9.99	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	177.90	85	12.47	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	187.15	90	21.72	13	*ns*
Calibration Sample, Dataset 4 vs. Validation Sample, Dataset 4					
1. Baseline model; no equality constraints	169.85	77			
2. Measurement model; all factor loadings constrained equal	176.42	82	6.57	5	*ns*
3. Structural model; all regression paths constrained equal	190.25	85	20.40	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	177.41	83	7.56	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	189.19	84	19.34	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	178.43	84	8.58	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	180.63	85	10.78	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	195.85	90	26.00	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	180.64	86	10.79	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	181.94	87	12.09	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	187.05	88	17.20	11	*ns*
(Model H) Correlation between rank and combat exposure constrained equal	190.69	89	20.84	12	*ns*
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	195.85	90	26.00	13	.05
Calibration Sample, Dataset 4 vs. Validation Sample, Dataset 5					
1. Baseline model; no equality constraints	171.52	77			
2. Measurement model; factor loadings constrained equal	178.39	82	6.87	5	*ns*

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
3. Structural model; regression paths constrained equal	186.95	85	15.43	8	*ns*
4. Structural model; covariance among exogenous variables constrained equal	198.97	91	27.45	14	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	190.59	87	19.07	10	.05
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	191.36	87	19.84	10	.05
(Model G) Correlation between years of service and rank constrained equal	193.19	87	21.67	10	.05
(Model H) Correlation between rank and combat exposure constrained equal	193.79	87	22.27	10	.05
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	191.71	87	20.19	10	.05
Calibration Sample, Dataset 5 vs. Validation Sample, Dataset 1					
1. Baseline model; no equality constraints	167.54	77			
2. Measurement model; all factor loadings constrained equal	174.03	82	6.49	5	*ns*
3. Structural model; all regression paths constrained equal	187.14	85	19.60	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	175.65	83	8.11	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	185.93	84	18.39	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	176.82	84	9.28	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	178.11	85	10.57	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	188.33	90	20.79	13	*ns*
Calibration Sample, Dataset 5 vs. Validation Sample, Dataset 2					
1. Baseline model; no equality constraints	152.93	77			
2. Measurement model; all factor loadings constrained equal	159.58	82	6.65	5	*ns*
3. Structural model; all regression paths constrained equal	178.62	85	25.69	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	162.45	83	9.52	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	177.31	84	24.38	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	163.68	84	10.75	7	*ns*

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
(Model D) Path between psychological distress and ethical attitudes constrained equal	165.08	85	12.15	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	174.28	90	21.35	13	*ns*
Calibration Sample, Dataset 5 vs. Validation Sample, Dataset 3					
1. Baseline model; no equality constraints	156.93	77			
2. Measurement model; all factor loadings constrained equal	163.28	82	6.35	5	*ns*
3. Structural model; all regression paths constrained equal	179.71	85	22.78	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	167.06	83	10.13	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	178.50	84	21.57	7	.01
(Model C) Path between combat exposure and psychological distress constrained equal	168.22	84	11.29	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	169.42	85	12.49	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	179.54	90	22.61	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	170.81	86	13.88	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	173.31	87	16.38	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	173.38	88	16.45	11	*ns*
(Model H) Correlation between rank and combat exposure constrained equal	175.03	89	18.10	12	*ns*
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	179.54	90	22.61	13	.05
Calibration Sample, Dataset 5 vs. Validation Sample, Dataset 4					
1. Baseline model; no equality constraints	161.32	77			
2. Measurement model; all factor loadings constrained equal	167.71	82	6.39	5	*ns*
3. Structural model; all regression paths constrained equal	182.11	85	20.79	8	.01
(Model A) Path between years of service and ethical attitudes constrained equal	169.61	83	8.29	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	180.93	84	19.61	7	.01

Table 26 continued

Model description	χ^2	*df*	$\chi^2\Delta$	Δdf	Statistical significance
(Model C) Path between combat exposure and psychological distress constrained equal	170.74	84	9.42	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	171.76	85	10.44	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	185.57	90	24.25	13	.05
(Model E) Correlation between years of service and number of UN/NATO tours constrained equal	171.90	86	10.58	9	*ns*
(Model F) Correlation between rank and number of UN/NATO tours constrained equal	173.82	87	12.50	10	*ns*
(Model G) Correlation between years of service and rank constrained equal	176.78	88	15.46	11	*ns*
(Model H) Correlation between rank and combat exposure constrained equal	180.04	89	18.72	12	*ns*
(Model I) Correlation between combat exposure and number of UN/NATO tours constrained equal	185.57	90	24.25	13	.05
Calibration Sample, Dataset 5 vs. Validation Sample, Dataset 5					
1. Baseline model; no equality constraints	163.06	77			
2. Measurement model; all factor loadings constrained equal	169.77	82	6.71	5	*ns*
3. Structural model; all regression paths constrained equal	178.63	85	15.57	8	.05
(Model A) Path between years of service and ethical attitudes constrained equal	170.19	83	7.13	6	*ns*
(Model B) Path between rank and ethical attitudes constrained equal	177.42	84	14.36	7	.05
(Model C) Path between combat exposure and psychological distress constrained equal	171.37	84	8.31	7	*ns*
(Model D) Path between psychological distress and ethical attitudes constrained equal	172.68	85	9.62	8	*ns*
4. Structural model; all correlations among exogenous variables constrained equal	181.61	90	18.55	13	*ns*

Note. $\chi^2\Delta$ = difference in χ^2 values between models; Δdf = difference in the number of degree of freedom between models.

Appendix P

Table 27

Rate of Exposure (experienced at least once) to the Combat Stressors Listed on the HDO Survey Stress on Operations Scale (before multiple imputations)

Potentially Stressful Combat Situations in the HDO Survey Stress on Operations Scale	Entire Sample (N = 819)	
	Count	Valid %
Being attacked or ambushed.	**448**	**54.9**
Seeing destroyed homes or villages.	**443**	**54.6**
Receiving small arms fire.	410	50.4
Seeing dead bodies or human remains.	391	48.1
Handling or uncovering human remains.	211	26.0
Witnessing an accident which resulted in serious injury or death.	262	32.2
Witnessing violence with the local population or between ethnic groups.	217	26.7
Seeing dead or seriously injured Canadians.	350	43.0
Knowing someone seriously injured or killed.	**616**	**75.5**
Participating in demining operations.	209	25.9
Improvised explosive device/booby trap exploding near you.	319	39.2
Working in areas that were mined or had improvised explosive devices.	**477**	**58.2**
Having hostile reactions from local civilians.	375	45.8
Disarming civilians.	94	11.6
Being in threatening situations where you were unable to respond because of the rules of engagement (ROE).	230	28.2
Shooting or directing fire at the enemy.	232	48.4
Calling in fire on the enemy.	102	12.5
Engaging in hand-to-hand combat.	42	5.1
Clearing/searching homes or buildings.	260	31.8
Clearing/searching caves or bunkers.	99	12.2
Witnessing brutality/mistreatment toward non-combatants.	77	9.4
Being wounded/injured.	63	7.7
Seeing ill/injured people you were unable to help.	233	28.6
Receiving incoming artillery, rocket, or mortar fire.	**579**	**71.3**
Being directly responsible for the death of an enemy combatant.	101	12.5
Observing violations of the Law of Armed Conflict/Geneva Conventions.	41	5.0
Being responsible for the death of Canadian or Allied personnel.	27	3.3
Having a member of your own unit become a casualty.	397	48.8
Had a close call; dud landed near you.	232	28.5
Had a close call; a bullet or shrapnel hit a piece of your personal equipment.	109	13.4
Had a close call; equipment shot off your body.	23	2.8
Had a close call; was shot or hit, but protective equipment saved you.	30	3.7
Had a buddy shot or hit who was near you.	102	12.5
Informed unit member/friend of a soldier's death.	127	15.7

Note. The five most frequent combat stressors are in bold.

Table 28

Rate of Endorsement (percent Agree or Strongly agree) to the Statements Listed on the Moral Climate scale (before multiple imputations)

Statements on the HDO Survey Ethical Attitudes Scale	Entire Sample (N = 819)	
	Count	Valid %
Torture should not be allowed even if it might save the life of coalition personnel.	318	39.4
Torture should not be allowed even if it would lead to important information about insurgents.	369	45.7
All non-combatants should be treated with dignity and respect.	655	80.9
I would not risk my own safety to help a non-combatant in danger.	414	51.6
Verbal threats to non-combatants should be allowed in order to gather important information about insurgents.	290	35.9
The Law of Armed Conflict should not be followed when insurgents are not respecting them.	419	51.8
All detainees should be treated with dignity and respect.	530	65.5
Those who surrender do not need to be protected from the effects of hostilities.	550	67.9
I would report breaches to the CF Code of Conduct and Law of Armed Conflict even if it meant I would be subjected to retaliation from fellow soldiers.	377	46.6
All breaches to the CF Code of Conduct or Law of Armed Conflict should be reported.	413	51.4
In conducting operations, I would expose myself to greater risk to minimize harm to civilians and their property.	352	43.4
We should provide medical care according to greatest need even if it means that wounded insurgents will receive treatment before wounded Canadian soldiers.	200	22.8

Table 29

Descriptive Statistics and Correlation Matrix (Study 2, Dataset 2)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Cbt. Exp.	55.73	18.29	34-170	–														
2. Nervous.	3.05	1.49	2-10	.23**	–													
3. Agitation	3.33	1.88	2-10	.22**	.62**	–												
4. Fatigue	3.91	1.85	2-10	.19**	.60**	.63**	–											
5. Neg. Aff.	5.53	2.92	4-20	.19**	.65**	.59**	.65**	–										
6. Reporting	6.78	2.00	2-10	-.18**	-.12**	-.12**	-.10**	-.11**	–									
7. Torture	6.34	2.35	2-10	-.15**	-.11**	-.11**	-.09*	-.10**	.52**	–								
8. Gen. Att.	24.59	4.62	7-35	-.21**	-.23**	-.18**	-.21**	-.22**	.54**	.53**	–							
9. Ethos	3.70	1.07	1-5	.06	-.09*	-.08*	-.15**	-.19**	.17**	.14**	.19**	–						
10. Morale	3.66	1.10	1-5	.03	-.12**	-.12**	-.18**	-.25**	.18**	.13**	.20**	.75**	–					
11. Cohesion	3.76	1.12	1-5	.13**	-.08*	-.06	-.12**	-.18**	.08*	.07*	.09*	.69**	.75**	–				
12. Leadership	3.87	1.17	1-5	.08*	-.05	-.08*	-.13**	-.19**	.07	.05	.06	.50**	.52**	.55**	–			
13. Rank	1.56	.92	1-4	.03	.03	.06	.06	.04	.23**	.18**	.24**	.04	.07	.04	-.02	–		
14. Yrs. Svc.	2.37	1.50	1-6	-.07	-.03	-.06	.01	-.02	.23**	.16**	.22**	.02	.02	-.02	-.00	.47**	–	
15. No. Tours	2.02	1.39	1-5	.05	-.04	-.04	-.02	-.02	.14**	.12**	.13**	.02	.03	.03	.02	.32**	.61**	–

Note. N = 819. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Table 30

Descriptive Statistics and Correlation Matrix (Study 2, Dataset 3)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Cbt. Exp.	55.73	18.29	34-170	–														
2. Nervous.	3.06	1.49	2-10	.24**	–													
3. Agitation	3.33	1.88	2-10	.22**	.62**	–												
4. Fatigue	3.92	1.85	2-10	.20**	.60**	.63**	–											
5. Neg. Aff.	5.53	2.92	4-20	.19**	.65**	.59**	.65**	–										
6. Reporting	6.79	2.00	2-10	-.18**	-.12**	-.12**	-.11**	-.11**	–									
7. Torture	6.34	2.35	2-10	-.15**	-.11**	-.10**	-.09*	-.10**	.52**	–								
8. Gen. Att.	24.60	4.61	7-35	-.21**	-.23**	-.18**	-.22**	-.22**	.54**	.52**	–							
9. Ethos	3.70	1.07	1-5	.06	-.08*	-.07*	-.15**	-.19**	.17**	.14**	.18**	–						
10. Morale	3.66	1.10	1-5	.03	-.12**	-.12**	-.18**	-.25**	.18**	.13**	.20**	.75**	–					
11. Cohesion	3.76	1.12	1-5	.13**	-.08*	-.06	-.12**	-.18**	.07*	.07*	.08*	.69**	.75**	–				
12. Leadership	3.88	1.16	1-5	.09*	-.05	-.07*	-.13**	-.18**	.06	.05	.06	.50**	.52**	.55**	–			
13. Rank	1.53	.90	1-4	.00	.00	.00	.04	.04	.25**	.19**	.28**	.05	.07*	.02	-.02	–		
14. Yrs. Svc.	2.35	1.51	1-6	-.07*	-.03	-.06	-.01	-.01	.22**	.15**	.22**	.03	.03	-.01	-.01	.46**	–	
15. No. Tours	1.99	1.34	1-5	.06	-.04	-.05	-.03	-.06	.15**	.12**	.16**	.03	.05	.04	.04	.32**	.64**	–

Note. N = 819. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Table 31

Descriptive Statistics and Correlation Matrix (Study 2, Dataset 4)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Cbt. Exp.	55.74	18.27	34-170	–														
2. Nervous.	3.06	1.49	2-10	.24**	–													
3. Agitation	3.33	1.88	2-10	.22**	.62**	–												
4. Fatigue	3.91	1.85	2-10	.20**	.60**	.63**	–											
5. Neg. Aff.	5.53	2.92	4-20	.19**	.66**	.59**	.65**	–										
6. Reporting	6.79	2.00	2-10	-.17**	-.12**	-.12**	-.11**	-.11**	–									
7. Torture	6.35	2.35	2-10	-.16**	-.11**	-.11**	-.09*	-.10**	.52**	–								
8. Gen. Att.	24.60	4.62	7-35	-.21**	-.23**	-.18**	-.22**	-.22**	.54**	.52**	–							
9. Ethos	3.70	1.07	1-5	.06	-.09*	-.08*	-.15**	-.20**	.17**	.15**	.19**	–						
10. Morale	3.66	1.10	1-5	.03	-.12**	-.12**	-.18**	-.25**	.18**	.14**	.21**	.75**	–					
11. Cohesion	3.76	1.12	1-5	.13**	-.08*	-.06	-.12**	-.18**	.07*	.07*	.09**	.69**	.75**	–				
12. Leadership	3.88	1.16	1-5	.09*	-.05	-.07*	-.13**	-.18**	.07	.05	.07	.51**	.52**	.55**	–			
13. Rank	1.55	.90	1-4	.04	.04	.04	.05	.05	.23**	.16**	.24**	.05	.08*	.03	-.02	–		
14. Yrs. Svc.	2.34	1.50	1-6	-.07	-.01	-.05	.01	.00	.24**	.18**	.22**	.02	.02	.00	-.01	.42**	–	
15. No. Tours	1.99	1.35	1-5	.09**	-.03	-.04	-.02	-.04	.15**	.13**	.13**	.03	.04	.05	.04	.39**	.63**	–

Note. N = 819. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Table 32

Descriptive Statistics and Correlation Matrix (Study 2, Dataset 5)

Variables	*M*	*SD*	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Cbt. Exp.	55.74	18.27	34-170	–														
2. Nervous.	3.06	1.50	2-10	.24**	–													
3. Agitation	3.33	1.88	2-10	.22**	.62**	–												
4. Fatigue	3.92	1.85	2-10	.20**	.60**	.63**	–											
5. Neg. Aff.	5.53	2.92	4-20	.19**	.66**	.59**	.65**	–										
6. Reporting	6.80	1.99	2-10	-.17**	-.12**	-.12**	-.10**	-.10**	–									
7. Torture	6.35	2.35	2-10	-.15**	-.11**	-.11**	-.09**	-.10**	.52**	–								
8. Gen. Att.	24.61	4.62	7-35	-.20**	-.23**	-.18**	-.21**	-.22**	.54**	.52**	–							
9. Ethos	3.70	1.07	1-5	.06	-.08*	-.07*	-.15**	-.19**	.17**	.14**	.19**	–						
10. Morale	3.66	1.10	1-5	.03	-.11**	-.12**	-.18**	-.25**	.17**	.13**	.20**	.75**	–					
11. Cohesion	3.75	1.12	1-5	.13**	-.07*	-.06	-.12**	-.18**	.08*	.08*	.09*	.69**	.75**	–				
12. Leadership	3.87	1.17	1-5	.09*	-.05	-.07*	-.13**	-.18**	.07	.04	.06	.50**	.52**	.55**	–			
13. Rank	1.54	.90	1-4	-.01	.05	.05	.04	.04	.25**	.22**	.27**	.07	.10**	.05	-.00	–		
14. Yrs. Svc.	2.31	1.49	1-6	-.08*	-.07	-.08*	-.02	-.05	.24**	.18**	.24**	.04	.05	.00	.01	.44**	–	
15. No. Tours	1.98	1.32	1-5	.09*	-.03	-.03	-.00	-.03	.15**	.14**	.14**	.02	.03	.04	.03	.35**	.62**	–

Note. N = 819. Cbt. Exp. = Combat exposure; Nervous. = Nervousness; Neg. Aff. = Negative affects; Gen. Att. = General attitudes towards treatment of detainees and non-combatants; Yrs. Svc. = Years of service; No. Tours = Number of UN/NATO tours. Correlations among variables related to the same theme (or latent construct) are encapsulated within the same coloured block.

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

Appendix R

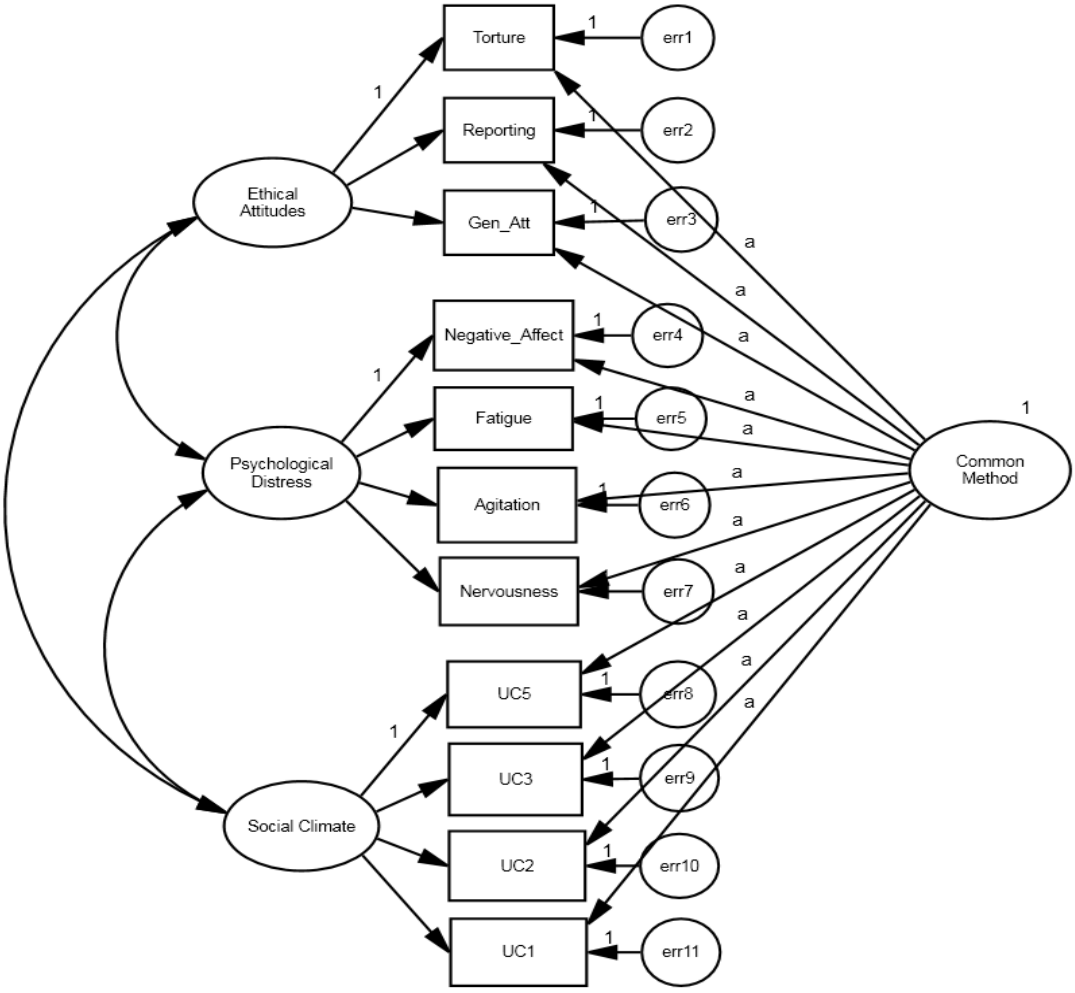


Figure 16. Measurement model for Study 2

Appendix S

Table 33

Fit Indices for the Measurement Model (Study 2)

Model	χ^2 Statistics		RMSEA	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta(1)$
	χ^2	*df*	(90% CI)						
Dataset 2									
1. Measurement model w/o method factor	118.25	41	.05 (.04-.06)	*ns*	.98	.98	.72	168.25	
2. Measurement model w/ method factor	101.29	40	.04 (.03-.05)	*ns*	.99	.98	.71	153.29	16.96**
Dataset 3									
1. Measurement model w/o method factor	117.43	41	.05 (.04-.06)	*ns*	.98	.98	.72	167.43	
2. Measurement model w/ method factor	99.65	40	.04 (.03-.05)	*ns*	.99	.98	.71	151.65	17.78**
Dataset 4									
1. Measurement model w/o method factor	117.02	41	.05 (.04-.06)	*ns*	.98	.98	.72	167.02	
2. Measurement model w/ method factor	100.49	40	.04 (.03-.05)	*ns*	.99	.98	.71	152.49	16.53**
Dataset 5									
1. Measurement model w/o method factor	116.55	41	.05 (.04-.06)	*ns*	.98	.98	.72	166.55	
2. Measurement model w/ method factor	98.81	40	.04 (.03-.05)	*ns*	.99	.98	.71	150.81	17.74**

Note. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; PNFI = Parsimony Normed Fit Index; AIC = Akaike Information Criterion; $\chi^2\Delta$ = difference in χ^2 values between models.

** $p < .01$.

Appendix T

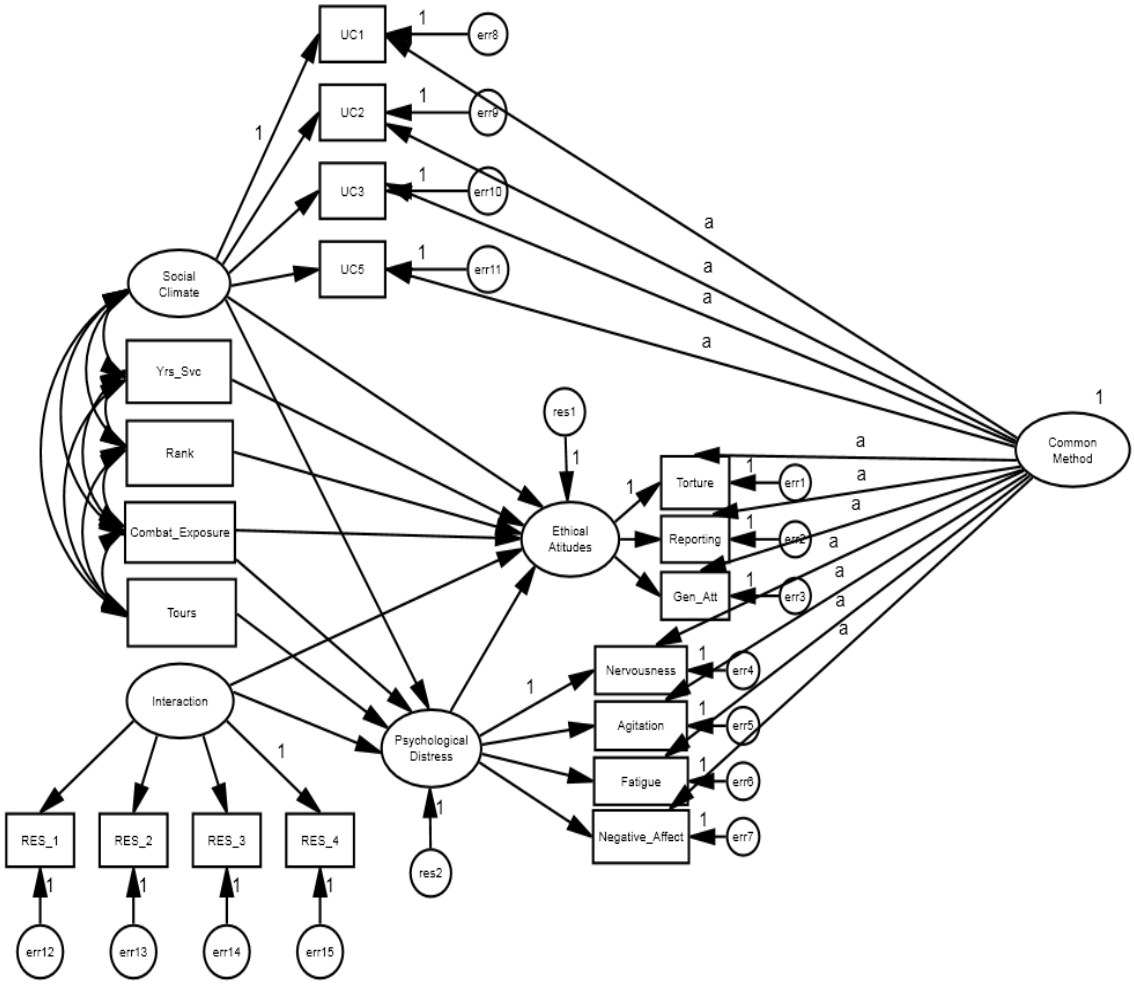


Figure 17. Structural equation model for Study 2

Table 34

Goodness-of-Fit Indices for Model Comparisons (Study 2)

Model	χ^2 Statistics		RMSEA							
	χ^2	*df*	(90% CI)	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta$	Δdf
Dataset 2										
1. Direct effect and first stage moderation model	344.98	135	.04 (.04-.05)	*ns*	.97	.96	.75	454.98		
2. Direct effect moderation model	346.75	136	.04 (.04-.05)	*ns*	.97	.96	.76	454.75	1.77	1
3. First stage moderation model	345.67	136	.04 (.04-.05)	*ns*	.97	.96	.76	453.67	.69	1
4. Partially mediated model w/o moderation	347.70	137	.04 (.04-.05)	*ns*	.97	.96	.76	453.70	2.72	2
5. Fully mediated model w/o moderation	366.85	138	.05 (.04-.05)	*ns*	.97	.96	.77	470.85	21.87**	3
6. Partially mediated model w/o moderation and insignificant paths	355.28	144	.04 (.04-.05)	*ns*	.97	.97	.80	485.28	7.58	7
Dataset 3										
1. Direct effect and first stage moderation model	355.84	135	.05 (.04-.05)	*ns*	.97	.96	.75	465.84		
2. Direct effect moderation model	357.46	136	.05 (.04-.05)	*ns*	.97	.96	.76	465.46	1.62	1
3. First stage moderation model	356.70	136	.05 (.04-.05)	*ns*	.97	.96	.76	464.70	.86	1
4. Partially mediated model w/o moderation	358.64	137	.04 (.04-.05)	*ns*	.97	.96	.76	464.64	2.80	2
5. Fully mediated model w/o moderation	375.93	138	.05 (.04-.05)	*ns*	.97	.96	.77	379.93	20.09**	3
6. Partially mediated model w/o moderation and insignificant paths	369.46	144	.04 (.04-.05)	*ns*	.97	.96	.80	499.46	10.82	7

Table 34 continued

Model	χ^2 Statistics		RMSEA							
	χ^2	*df*	(90% CI)	PCLOSE	CFI	TLI	PNFI	AIC	$\chi^2\Delta$	Δdf
Dataset 4										
1. Direct effect and first stage moderation model	361.62	135	.05 (.04-.05)	*ns*	.97	.96	.75	471.62		
2. Direct effect moderation model	363.33	136	.05 (.04-.05)	*ns*	.97	.96	.76	471.33	1.71	1
3. First stage moderation model	362.08	136	.05 (.04-.05)	*ns*	.97	.96	.76	470.08	.46	1
4. Partially mediated model w/o moderation	364.00	137	.05 (.04-.05)	*ns*	.97	.96	.76	470.00	2.38	2
5. Fully mediated model w/o moderation	382.86	138	.05 (.04-.05)	*ns*	.97	.96	.77	484.86	21.24**	3
6. Partially mediated model w/o moderation and insignificant paths	376.77	144	.04 (.04-.05)	*ns*	.97	.96	.80	506.77	12.77	7
Dataset 5										
1. Direct effect and first stage moderation model	357.08	135	.05 (.04-.05)	*ns*	.97	.96	.75	467.08		
2. Direct effect moderation model	358.93	136	.05 (.04-.05)	*ns*	.97	.96	.76	466.93	1.85	1
3. First stage moderation model	358.54	136	.05 (.04-.05)	*ns*	.97	.96	.76	466.54	1.46	1
4. Partially mediated model w/o moderation	360.81	137	.05 (.04-.05)	*ns*	.97	.96	.76	466.81	3.73	2
5. Fully mediated model w/o moderation	376.17	138	.05 (.04-.05)	*ns*	.97	.96	.77	480.17	19.09**	3
6. Partially mediated model w/o moderation and insignificant paths	373.68	144	.04 (.04-.05)	*ns*	.97	.96	.80	503.68	12.87	7

Note. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; PNFI = Parsimony Normed Fit Index; AIC = Akaike Information Criterion; $\chi^2\Delta$ = difference in χ^2 values between models. Model 6 was compared to Model 4, hence the 7 *df*. ** $p < .01$.