# WHEN DO THEIR CASUALTIES COUNT?

# EXPLORING WARTIME DECISIONS THAT PIT SECURITY AGAINST HARM

A Dissertation

by

DWIGHT ANDREW ROBLYER

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2009

Major Subject: Political Science

WHEN DO THEIR CASUALTIES COUNT?

EXPLORING WARTIME DECISIONS THAT PIT SECURITY AGAINST HARM

A Dissertation

by

DWIGHT ANDREW ROBLYER

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Approved by:

| | |
|---|---|
| Chair of Committee, | Nehemia Geva |
| Committee Members, | Kenneth J. Meier |
| | Michael T. Koch |
| | Scott E. Robinson |
| Head of Department, | James R. Rogers |

December 2009

Major Subject: Political Science

# ABSTRACT

When Do Their Casualties Count? Exploring Wartime Decisions that Pit Security Against Harm. (December 2009)

Dwight Andrew Roblyer, B.A., Texas A&M University;

M.S., Air Force Institute of Technology

Chair of Advisory Committee: Dr. Nehemia Geva

This dissertation offers a new understanding about wartime decision making in the face of likely, but unintended, harm to foreign civilians. It empirically identifies conditions under which leaders in democratic nations are more or less likely to choose to attack a target when confronted with a dilemma between pursuing national security objectives and avoiding civilian casualties.

An innovative targeting decision model was constructed that described both the theorized structure of the decisions inputs and the process by which these inputs are assembled into a choice. The model went beyond the normal target benefit and civilian casualty cost considerations of proportionality to also include the contextual input of prospect frame. Decision makers were expected to address the same benefit and cost differently depending on whether they were winning or losing the conflict. This was because the prospect frame would influence their risk attitudes, as predicted by prospect theory. This model was then tested via two decision-making experiments that used military officers and defense civilians as participants. Additionally, a statistical analysis

of data collected from an extended period of the second Intifada was done to seek evidence that the model also applied in actual wartime decision making.

All three tests supported portions of the targeting decision model. Higher target benefit and lower civilian casualty estimates increased support for the planned attack. Prospect frame influenced decisions in the cases where both target value and the civilian casualty estimates were high and the resulting dilemma was very difficult. In these situations, those told that their forces were losing the conflict were less sensitive to humanitarian harm and more likely to support the attack than when they were told their side was winning. Furthermore, the Intifada data analysis of attacks approved by Israeli officials against Palestinians found this same effect of prospect frame held generally across all six years of observations.

# DEDICATION

To my parents, Don and Donna Roblyer, who have been my “head yell leaders” since my first sojourn here at Texas A&M in the early 1980s. They have been unflagging in their prayers for me and my family as we pushed through these most recent three and one-half years. Their encouragement and their faith in God and in me mean more than I will ever be able to express.

# ACKNOWLEDGEMENTS

I would like to thank my committee chair, Nehemia Geva, and my committee members, Ken Meier, Mike Koch, and Scott Robinson for their gracious manner and expert guidance during the development of this dissertation. However, a particular debt of gratitude is owed to Nehemia, who gave generously of his time beginning with my first week in this program in order to help me plan and execute this dissertation. It was his interest, encouragement, leadership, and self-sacrifice that repeatedly re-inspired me to complete this project.

I have also been graced by fellow graduate students, the ever-friendly and helpful staff of the department, and the interest and wisdom of the faculty. This school experience will not soon be forgotten, but the high points will be the wonderful people with whom I studied, shared, and labored. My gratitude especially goes to Lou Ellen Herr, the official foster mom of all political science graduate students at Texas A&M. I warmed her “counseling chair” regularly and her support for me was deeply appreciated.

I owe much to my family who said figurative goodbyes to me three years ago as I left for the first of many seven-day work weeks. I owe a special debt to my wife, Kathy, for her never-relenting love for, belief in, and forbearance of an often despairing partner. She and our kids have anxiously awaited the completion of this doctoral program and the return of their husband and father. Me, too!

Finally, I believe the source of all good things is from above. My personal relationship with God has been battered, but deepened, through this experience. I hope that I have become better prepared for whatever He has in store now and beyond.

DISCLAIMER

# NOMENCLATURE

| | |
|---|---|
| CCP | Cumulative Choice Propensity |
| TARGET | Independent Variable for Target Value in Experiments |
| HARM | Independent Variable for Estimated Civilian Casualties in Experiments |
| FRAME | Independent Variable for Prospect Frame in Experiments |
| ATTACK | Dependent Variable for Decision Outcome in Experiments |
| INTENSITY | Dependent Variable for Decision Outcome in Experiments |

# TABLE OF CONTENTS

# LIST OF FIGURES

# LIST OF TABLES

# CHAPTER I

# INTRODUCTION:

# CIVILIAN CASUALTIES AND DILEMMAS IN WAR

Civilian casualties in the course of warfare are taking on greater importance in world affairs. This is evident in multiple ways. Matters of justice in how a state's army conducts warfare have been codified by international agreements such as the Geneva Conventions and Additional Protocols. Treatment of civilians in wartime has been taken up as a raison d'etre by high-profile organizations such as the International Committee of the Red Cross. Consideration of just behavior in warfare has been reinvigorated by contemporary scholars such as Walzer (1977) and numerous others. Incidents of civilian deaths and injuries during war have proven to be magnets for U.S. and international media attention. Additionally, large civilian casualty counts have caused some nations to plea for, and others to institute, new technologies and tactics for fighting intended to spare more civilians, even at the cost of achieving other goals.

One result of this heightened attention to civilian casualties in wartime is that world leaders, the militaries they command, and the publics who keep them in office are considering new options and priorities in *how* a war is fought. Within democratic contexts, choices are being made regularly in cabinet rooms and command centers that consider a tradeoff between gaining a target's benefit toward national security and exacting a cost by harming local civilians in the environs of the strike. Fresh evidence

This dissertation follows the style of *American Political Science Review*.

has recently appeared pointing to new priorities and a more pronounced emphasis on reducing civilian casualties in the Afghanistan war against the Taliban. The new U.S. commander of American and NATO forces characterized his redirection of the war effort in Afghanistan as emphasizing the protection of civilians from violence instead of the number of enemy combatants killed (Shanker 2009).

Such behavior poses a puzzle: Why do democratic governments care about creating civilian casualties in distant war zones? The classic military-realist purpose of war is to win. General William T. Sherman's famous assessments equating war with hell and necessary cruelty is a commonly held conservative opinion as to the most direct path for a nation to follow en route to victory. Nevertheless, the civilian and military officials within democratic governments are increasingly engaging in *attack* or *do-not-attack* decisions based in part on harm posed to local civilians. Accordingly, this dissertation will focus on developing new understanding about wartime decision making in the face of likely, but unintended, harm to foreign civilians. Under what conditions are officials in democratic governments more likely to choose to attack or not when confronted with a wartime dilemma between pursuing national security objectives and avoiding civilian casualties? If fighting in a foreign land among a foreign people, when do *their* civilian casualties count enough to outweigh the security benefits sought through an attack?

As part of the routine target planning process, potential harm to foreign civilians is a major consideration for the U.S. and other governments with strong democratic values. However, it is also not the only consideration, nor does it always dominate the decision. In a subset of targeting situations, the risk to noncombatants is both significant and known in advance, but the attack proceeds because the target is considered to be of such great importance. The account below illustrates one possible outcome from such a risk-filled situation.

> *June 19, 2007: U.S. special operations forces were targeting the leader of al-Qaida in Afghanistan—one of the organization's top commanders—when they launched an attack against a compound that killed seven children Sunday in Paktika province of eastern Afghanistan… According to several officials, and contrary to previous statements, the U.S. military knew there were children at the compound but considered the target of such high value it was worth the risk of potential collateral damage.* (Miklaszewski, Kube, and Windrem 2007)

While civilian casualties are not an unusual occurrence in war, they are often expected in contemporary warfare to be accidental, unforeseen, and unintended. The attack described above highlights a different kind of situation where civilians were known to be in harm's way before the target was approved—a situation that is likely to become all the more common whenever combatants operate in the midst of noncombatant populations. This problem of fighting in close proximity to civilians is clearly apparent in other theaters, both past and present, including Israeli operations in the Occupied Territories and NATO operations in Serbia.

These conditions set up a dilemma for national leaders and other government officials. On one hand is the pressing need for victory over an adversary. On the other is a commitment toward minimizing harm to civilians in wartime, founded in the democratic beliefs in the universal rights of life and liberty. Both of these objectives are admirable and highly prized, but in these exasperating situations, decision makers must often sacrifice one to achieve the other—they must "do bad" in order to "do good."

Yet, there is a significant absence of scientific investigations into these decisions in the face of dilemmas between national security and humanitarian harm. Until recently, political science scholars had largely studied only the effects of a state's own military casualties on decisions regarding war (Page and Brody 1972; Mueller 1973; Gartner 1997; Gartner 2008; Sullivan 2008). Some general insights arising from these studies may be helpful in looking at the effects of civilian casualties, but these previous results are not expected to apply wholly to a state's consideration of the spilling and the sparing of blood other than its own.

Within the last 10 to 15 years, political scientists have also begun to consider the role of wartime civilian casualties in both the interstate and counterinsurgency contexts. Some researchers have looked at the causal factors of large numbers of intentional civilian deaths in war (see Rummel 1995; Davenport and Armstrong 2004; Valentino, Huth, and Balch-Lindsay 2004; Valentino, Huth, and Croco 2006; Downes 2006). Only recently have studies looked at the causes and effects of both intentional and unintentional civilian casualties (Downes 2007; Bennett 2008). Yet these studies have drawn their conclusions primarily at the state level of analysis without considering the role of the individual decision makers who have made the choices that determined the state's actions. They have been directed at refining institutional theories using only the characteristics of the resulting historical events, forcing inference of the choice considerations and process that led to these results. Also, these studies largely have not addressed the cases of unintentional, but foreseeable, civilian casualties on the opposing side of the conflict. Furthermore, the decision process associated with these choices has not yet been explored.

This dissertation seeks to address some of the numerous unknowns surrounding this pressing issue of considerations of humanitarian harm within wartime decision making. First, it does this through developing an innovative model that moves beyond the traditional rational choice assumptions. The model describes targeting decision inputs and outcomes. It also addresses how individuals make targeting choices. The distinction that people, not states, make these decisions is all the more important when the available choices place deeply-rooted values in direct conflict, as often occurs in targeting operations. Second, this investigation tests the decision-making model using multiple methods, levels, and national settings. Two experiments bring to bear not only their inherent power to clearly infer causation, but also the expertise and experience of American senior military officers and defense civilians as decision-making participants. A statistical analysis of historical observations then tests the model using events from the second Intifada gathered into an original data set. The analysis checks for a relationship between the lethality and location of Palestinian terror attacks in Israel and the number of civilian casualties resulting from Israeli military operations.

The report of the investigation will be broken down into six additional chapters. Chapter II will briefly review pertinent literature in several areas that influence the pursuit of this research question. In conflict studies, it will focus on the relationships that researchers have uncovered regarding casualties of all types and war. Because the Just

War tradition is the basis for many of the concepts and vocabulary of international law and policy regarding treatment of civilians in wartime, the chapter will draw from writings about the application of Just War principles in order to characterize important considerations in the decision process of interest. Next, the chapter will include a discussion of rationale and role of studies that focus on decision making at the individual level of analysis. This form of international relations (IR) scholarship offers distinctly different insights than the more-popular traditional analytical approaches that study national-states within an international system. Finally, the review of literature will highlight political scientists' findings and advice regarding the use of prospect theory to describe decision outcomes in political settings involving risk.

Chapter III will provide a description of the decision-making theory upon which the study was based, present the model developed and the research questions it engenders, and briefly overview the rationale and methods selected to test the model. Central in this chapter will be two theoretical views of the model: one to explain decision outcome, based on prospect theory, and the other to explicate the choice process using the fundamentals of the Cognitive Calculus model (Geva, Mayhar, and Skorick 2000). Two experiments built around an airstrike target planning scenario and involving over 320 military officers and defense civilians were the primary means of investigating both views of the model. Additional evidence was also gathered using historical observations associated with the Israeli-Palestinian conflict commonly known as the second Intifada.

Chapters IV-VI will both provide further details of the research instruments, discuss the specific hypotheses that were tested, and document the results of the associated analyses. The first two of these chapters will discuss the two experiments sequentially, followed by a chapter reporting the statistical results arising from the Intifada investigation. Finally, Chapter VII will summarize the findings in relation to theoretical expectations, draw conclusions, and look ahead to the future program of research.

# CHAPTER II

# REVIEW OF LITERATURE

At least four areas of scholarly research and thought provide important foundations and background for this study. First, this chapter will look at the relationships documented by political scientists between conflict and military casualties. Second, it will expand this to include the investigations of civilian deaths as they relate to conflict. Next, writings about the Just War tradition will be considered as they assist in defining the security-harm dilemma that is at the focal point of this dissertation. This will be followed by an explanation of the place of individual-level theorizing and analysis in the overall body of IR scholarship. Finally, prospect theory will be discussed, with emphasis on its ability to incorporate the context of decisions and the resulting influence on the risk attitudes of individual decision makers, as well as the challenges it may pose in the investigation.

## CONFLICT STUDIES ON MILITARY CASUALTIES

Ever since the era of the Vietnam conflict, IR scholars have debated the significance of a nation's military casualties in its calculations of the costs of war and the ensuing impacts on politics. The following paragraphs will first highlight the studies which have found that military casualties matter in a significant way. A survey of some of the studies that disagree will then follow.

Mueller's 1973 book, *War, Presidents, and Public Opinion*, was the first to report a highly significant role played by military casualties in the sensitivities of the public and as a check on otherwise-aggressive state leaders. Since then, several contemporary studies have refined and extended Mueller's findings.

Looking at patterns of casualty occurrences and their affect on the public, Gartner and Segura (1998) showed that the manner in which casualties accumulate is tied to the amount of public opposition they generate. They emphasized that accelerating rates of loss in the very recent past, and not just the log of the overall cumulative count of casualties, was significantly related to drops in public support for war. The same team also found that the public's reaction was not sensitive to the race of the casualties (Gartner and Segura 2000). Several other studies have looked at the impact of military casualties on decision makers and their future political prospects. State-level casualties affected both candidate policy positions and election outcomes during the Vietnam War (Gartner, Segura, and Barrat 2004). More recently, U.S. casualties in Iraq were shown to have depressed vote shares for President Bush in 2004 and prevented a decisive election victory (Karol and Miguel 2006). Most recently, Gartner (2008) connected recent casualties, longer term casualty trends, and the interaction of both measures to public support for war.

However, other researchers have pointed to additional factors that can exert greater influence, under certain conditions, in determining public support for war. At the height of the Vietnam war, when approximately 100 American military members were dying each week, Page and Brody (1972) found that voter policy preferences regarding

Vietnam could only account for 1 or 2% of the variation in votes in the 1968 presidential election. Since then, an increasingly vocal opposition has offered their own evidence that other factors can temper and dominate military casualties. Looking at data on political and media activity and at public opinion polls, Larson (1996) found that the U.S. public regularly determined their support of a war using a cost-benefit calculation—not just by counting costs alone. He noted that the American people had been more willing to accept high casualty rates over the previous 55 years whenever they found a consensus of support among their political leadership—an indication that the benefits were worth the cost.

Jentleson (1992) and Britton and Jentleson (1998) argued similarly that the aims of a war were the most significant drivers in determining how much military casualties counted in U.S. public support. Their results showed that casualty tolerance was usually very high whenever the purpose of a war was to defend the United States or a key ally. However, when the military objectives were humanitarian in nature, a relatively few number of casualties could result in a rapid drop in support. Missions of this last type were seen as ventures that were not worth the cost. Focusing on a state's commitment to its wartime aims, Sullivan (2008) found evidence that military casualties are also the most important measure of the commitment of a state to its objectives in a conflict. Hence, both the public's sense of national commitment and their concern about the costs of withdrawal from the war can lead them to persevere in their support despite the military casualties.

Kull and Ramsay (2001) and Feaver and Gelpi (1999; 2004) concluded from their own research that public perceptions of probability of success drove U.S. public support for war. Their measures were not based on how individuals thought American forces were faring at that present time, but were strategic assessments of whether or not the country would eventually achieve its overall goals via the war. Gelpi, Feaver, and Reifler (2005) then went on to test several of the most commonly proposed factors head to head—military casualties, elite support, and war objectives—as well as others. They concluded that, while military casualties mattered, the most prominent driver of public support for war were two indicators of its potential benefit, or lack thereof. The leading driver was the probability of eventual success, followed by beliefs about the rightness or wrongness of the war. Yet, Voeten and Brewer (2006) found evidence of a direct connection between casualties and success, with increased casualties driving aggregate perceptions of success, which in turn impacted presidential approval.

This ongoing debate highlights the prominence of military casualties as the key determinant of perceptions of the cost of prosecuting a war, but also that those costs do not always hold sway in determining the outcome of decisions about the conflict. Highlighted here have also been the importance of the potential benefits of war, which are likely to be weighed against those costs. However, the questions of whether and how foreign civilian casualties might also enter into cost considerations of this sort remains unanswered by the research program focused on military casualties.

## CONFLICT STUDIES ON CIVILIAN CASUALTIES

Early empirical work on civilian casualties focused primarily on deliberate and institutional harm to civilians by governments at times other than war. Of academic interest to these researchers were instances of mass murder, genocide, and various other forms of repressive behavior. Rummel (1995) gathered data pointing to the deaths of nearly 170 million civilians at the hands of various governments and found evidence that democracies were less likely to commit such atrocities. This effect of democracy on repression of civilian groups was further investigated and refined by Davenport (1999) and Davenport and Armstrong (2004). These results were consistent with common expectations arising from the liberal values associated with democratic regimes.

Other political scientists have looked at the intentional killing of civilians during war. Valentino, Huth, and Balch-Lindsay (2004) studied mass killing in all kinds of wars and concluded that the difficulties of fighting against guerrilla insurgencies could cause regimes to choose to attack the civilian populations. They reasoned that this outcome was related to the fact that guerrillas often drew their support from the surrounding population. Another team modeled the intentional killing of civilians in interstate wars and found, on average, that previous international commitments to avoid such harms had no restraining effect on mass killing by governments (Valentino, Huth, and Croco 2006). Additionally, according to Valentino, Huth, and Croco (2006) and Downes (2006), insurgencies, costly and protracted conflicts of attrition, and wars of conquest were most likely to devolve into atrocious and lethal behaviors toward civilians.

Furthermore, the exact role of democratic regimes in these actions remains in dispute. Valentino, Huth, and Croco (2006) found evidence that the liberal norms of democracies were insufficient to regularly restrain these states from engaging in counter-civilian warfare. Eck and Hultman (2007) reported that autocracies are much more likely to engage in mass killing. Yet Downes (2007) provided evidence that democracies exhibited a stronger probability than any other type of regime to kill more than 50,000 civilians in wars between 1816 and 1945.[1]

Downes (2007) also expanded his analysis to run a related model that estimated the intensity of all civilian deaths in war that were directly caused by the belligerents on both sides, a measure of fatalities that was expanded beyond the measures used by previous researchers. In particular, this dependent variable included civilians who were unintentionally killed in the course of an attack on a military target—what is frequently referred to as "collateral damage"—between 1816 and 2003. Using this model, Downes tested a wide range of hypotheses and found further support for the prominent contributing role of wars of attrition, longer war durations, higher military casualties, and more aggressive war objectives in producing higher numbers of civilian fatalities. His results also strongly supported the position that democracies kill more civilians than non-democracies do when involved in wars of attrition.

The results that have arisen primarily from analyses of intentional killings of civilians in war may also point to interesting considerations in the study of unintentional

[1] The firebombing of Hamburg and the dropping of the atomic bombs in Japan were examples of single operations during World War II by the British and/or Americans that resulted in at least 40,000 civilian deaths on their own.

civilian casualties proposed here. This expectation is bolstered by the results of Clarke, et al. (2009, 136), who found evidence of real political costs associated with civilian casualties. Their analysis of British voters during the most recent war with Iraq found that negative news, as indexed by cumulative civilian casualties, prompted a 27.5-point decrease in the balance of approval ratings for Prime Minister Blair. Collectively, these previous studies highlight the sometimes ineffective restraint of international commitments, the uncertain role of democratic norms and practice, the danger of prolonged and costly wars, and the strong tendency under certain conditions toward seeking victory regardless of the cost in civilian lives. Lastly, the Cook et al. study points to political costs that can be associated with the fallout of civilian casualties in modern war.

## JUST WAR AND THE LAW OF WAR

Of late, the standards against which wartime behaviors of governments are commonly judged are the normative principles of the Just War tradition and the legal edicts of international humanitarian law (Walzer 1977, Hensel 2008). These standards have been discussed and analyzed by philosophers and social scientists with renewed vigor since the start of the second half of the twentieth century (Orend 2006). Together, the Just War tradition, from a moral standpoint, and international humanitarian law, from a legal perspective, describe for governments and their forces the wartime behaviors to which they are to aspire or avoid. These guidelines are of particular interest here because they not only discuss intentional acts of harm against civilians, but also unintentional ones. Thus these standards can be reasonably expected to play a prominent role in a democratic government's wartime decision process that involves risk of harming foreign civilians.[2] The key normative and legal principles of interest in this study will be highlighted here further to set the stage for a theoretical decision making model.

Walzer's *Just and Unjust Wars* (1977) has been noted by many as the hallmark of a renewal of broad academic interest in matters of both jus ad bellum and jus in bello, or the considerations of the ends which justify going to war and the means by which to fight justly (see Rengger 2002). The Just War tradition arose from the writings of Ambrose, Augustine, Suárez, Vitoria, and Grotius, among others, to serve as an aid to practical moral reflection about war. However, it has since been systematized and formalized in part into binding international agreements commonly known as the law of war (Hensel 2008, Rengger 2002).

At the foundation of this body of law is permission to attack enemy military targets and a prohibition against attacks on civilians or civilian objects[3] as intended targets (Roberts and Guelff 1989, 414-420). The concept of *military necessity* is the starting point of this permission. As used in the 1977 Geneva Protocol I, it dictates that a target be both legal and advantageous toward victory in a "concrete and direct" manner (Roberts and Guelff 1989, 420).[4] The concept of *discrimination* in the objective of an

---

[2] While also noting the conclusion of Valentino et al. (2006) with respect to the fact that their study found international agreements had no overall restraining effect on intentional mass killings of civilians in war.

[3] Includes facilities such as schools and hospitals when they are being used in their normal civilian functions.

[4] A more stringent standard for necessity would require that there exist no other way to accomplish the associated military objective. This is similar to the way *last resort* is used in the jus ad bellum standards of the Just War tradition (see Cohen 1989, 64). However, the more pragmatic standard based on legality and advantage is common usage in the law of war and in ethical discussions today (see Walzer 1979).

attack between that which is military and that which is civilian as is also an essential component of this permission. However, this admonition, is made ever more complex in application because of the intermingling of combatants and noncombatants on the modern battlefield. The law also lays out a principle of *proportionality* as it forbids attacks that are expected to result in harm to civilians that is excessive with respect to the "concrete and direct military advantage anticipated" (Roberts and Guelff 1989, 415-416).

The cases where complete discrimination between combatants and noncombatants is impossible and civilians or civilian objects are expected to be threatened by an attack against an authorized enemy target are the most difficult. International law expects these situations to be considered according to the principle of *double effect*, requiring states to weigh the anticipated contribution toward victory resulting from attacking a specific combatant target against the humanitarian cost of whatever amount of death, injury, or damage against civilians and their property is expected (see Walzer 1977, 152ff). The law of war insists that the attack should proceed only if this comparison of *proportionality* finds the likely benefits outweighing the costs.

While there are numerous discussions of how these criteria should be used in practice, the following order relates the way this research expects them to be applied:

- Determine if the target is legal and advantageous toward victory (militarily necessary).
- Develop an attack plan.

---

Nevertheless, Christopher (1994) asserts that the definition of military necessity is one of the problems in international law today.

- Estimate civilian casualties. If this is non-zero, recognize a double-effect situation.
- If double effect, search for alternatives that lower or eliminate the harm, if military necessity permits. Time, resources, or other factors may prevent or shorten this search if the target is to be attacked at all.
- Whatever attack option emerges from this process, either because it was the best of an exhaustive search or the initial option because there was no time for consideration of alternatives, is then subjected to the proportionality test.
- Given a double effect situation, if the benefit of a militarily necessary target is determined to be proportional to the collateral harm, it can be legally approved for attack.

However, there have been numerous criticisms of the practicality and sufficiency of these standards. These are important to consider, given the important role played by proportionality determinations and double effect in this decision-making research project. Walzer (1977) argued that the necessary comparison of the value of a military objective against that of innocent human lives was so fraught with moral peril that the best way to ensure a just outcome was for a state's own forces to accept additional risk of military casualties in order to reduce the likelihood of harming civilians. Other philosophers, ethicists, legal scholars, and social scientists have since added their own perspective to the challenge of complying with the proportionality standard in the face of double effect (Gardam 1993, Fenrick 2001, Crawford 2003, Kahl 2007).

Most recently, Smith (2008, 144) highlighted the central role of risk in these considerations of proportionality, which he framed as states effectively "trading civilian lives for military advantages." Couching the issue as one of economy of risk, Smith described a zero-sum process of risk allocation made by subtle calculations. He pointed to the ambiguities of the law of war and the lack of an unbiased measurement tool, such as Holland's hypothetical "proportionometer" (2004), as likely to allow these determinations to operate in the interest of the state's military rather than that of the foreign civilians (Smith 2008).

Decision makers charged with making these choices involving simultaneous risk to both national security and the lives of civilians operate in a normative gray area bounded by the "unmistakably lawful" and the "unambiguously unlawful" (Schmitt 2002). In this realm democratic governments and their agents frequently tread during the course of waging war. Because comparisons by individual decision makers of options involving high levels of risk will be key in defining the decision model of this process, the upcoming final two sections will first place the analysis of individual decisions within the context of IR scholarship and then highlight some of the literature on the primary theory that focuses on individual decision making under conditions of risk.

## DECISION MAKING AND THE INDIVIDUAL IN IR

Since the end of World War II and with the rise of Realism, IR theory has primarily revolved around the interaction of nation-states. Hudson (2002) explains that this focus on Realism, combined with the rise of Scientism, has been the foundation of the effort to discover the general laws that governed state behavior. As a result, states have been studied within the international system in which they existed and their differing capabilities and characteristics have been expected to determine their behavior. Empirical data has been collected and statistical or mathematical models have been derived. The result has been generalized explanations of state behavior at the systems level, mostly based on input-output models that have been tested with ever-increasing rigor and used to generate the mainstream of IR theory.

However, there have been other IR scholars who have believed that answers of great significance were also to be found within the "billiard balls" and "black boxes" that represented nation-states within systems-level analyses. Instead of looking at IR from the top, a "bottom-up" approach was needed (Chollet and Goldgeier 2002, 153). As early as the 1950s, models were being proposed that keyed, instead, to the decision makers who acted and were acted upon (Snyder, Bruck, and Sapin 2002). This approach drew heavily on the foundations of social cognition and its insistence on the intervening role of the organism in perceiving the stimulus and issuing the response (Fiske and Taylor 1991, 10). To the advocates of this individual-level of analyses, the people who have been so routinely absent from IR theorizing have been the actual agents behind the structure (Hudson 2002). In this way, the human decision maker should be viewed as the "ground" of IR, just as every science has its "ground," or foundational level, at which studied phenomena occur at basic levels (Hudson 2005, 1).

If individual decision makers were to assume a more primary role within IR scholarship, the assumptions and generalizations about the behavior of states had be able to be traced back to the real-world factors and considerations that influenced the individual choices of the humans. This was done through a focus on the decision makers as the object of analysis. Studying decision making in this way led to models that were more complex, incorporating any number of considerations from psychology, history, sociology, economics, and individual characteristics (Snyder, Brucker, and Sapin 2002).

Yet, while decision-making research has produced key insights and some core, generalizable propositions, Chollet and Godgeier (2002) assess that these efforts to understand the essence of decision-making processes of humans will continue to be hard fought and unlikely to be won. They continue, however, that this state of affairs is similar to the probability of systems-level theorists deriving the general theory of international politics that they so earnestly seek, even at the more abstract level at which they labor. While some would acknowledge a theoretical divide between the groups of scholars who use the system-level and decision-making approaches, there have also been efforts to build bridges across the divide (see Bueno de Mesquita and McDermott 2004).

This dissertation, by nature of its core puzzle, will focus on individual decisions as a means to understand targeting behavior during the system-level event of war. This level of analysis stands in contrast to almost all of the research cited in the earlier discussions of studies of military and civilian casualties. Thus, this approach faces new challenges, but also offers new promise. The following section will explain some of the background behind a theory of individual choice under the conditions of risk that is central to the research. Following this, Chapter III will explain the two views of the individual-level model used to develop the hypotheses of decision-making behavior.

## RISK, FRAMING, AND PROSPECT THEORY

Among the IR scholars who study individual-level phenomena, one manner of thinking about risk-laden decisions has been to draw upon prospect theory, developed by psychologists Kahneman and Tversky (1979). Like its expected utility cousin, prospect theory models individuals as rational decision makers who understand the connection between their goals and the option they choose and who seek to maximize the satisfaction they receive from that choice (see Jones 1994, 37). Unlike the expected utility paradigm, however, the prospect approach considers the ordering of an individual's preferences to be variable, influenced by the decision makers' current prospects for future success or failure (Boettcher 1995, Levy 1997, Bueno de Mesquita and McDermott 2004). Driving these prospects are not the present net asset levels of individuals' resources, but the perceived resource levels' distance above or below a significant reference point (Levy 1992a). According to prospect theory, this perception leads individuals to operate from within either a frame of gain or of loss.

Under the influence of these frames, decisions are often made differently than would be predicted by considering only the expected costs, benefits, and probabilities of the available choice options. Decision makers who perceive themselves in the frame (or domain) of gain are often risk averse and will act more conservatively when they would otherwise be expected to be more willing to gamble to further improve their position. Similarly, individuals making choices in the domain of loss are likely to become risk takers. This mindset results in a willingness to gamble in order to make up for losses when the situation would otherwise seem to dictate conservative behavior to protect against additional loss.

Jones (1994) explains that preferences—assumed to be invariant by rational choice, yet quite malleable under prospect theory—are not pure, but mixtures of two different types. Individuals may prefer an object of choice for itself or because it is a means to obtain something else they value. This “something else” can include intangibles, such as a sense of self-esteem or style. Furthermore, the objects of choice all have multidimensional attributes, only some of which are incorporated into any single choice. Because people are bounded in their rationality, they are selective in their attention and only consider the aspects they consider important at the time and disregard the rest (Jones 1994; Simon 1977, Simon 1985).

Said another way, prospect theory states that the context of a choice exacts powerful influence over decision makers and the option attributes upon which they will focus. *Frame* is the common label for that context within decision theory. Kahneman and Tversky (1979) theorized that the first step in decision making, consisting of framing and editing, was to make a preliminary analysis of the problem. Framing affected how reality was perceived and information managed and evaluated. This depended on the manner in which the problem was presented and on the individuality of the decision makers, including their norms, habits, and expectancies (Tversky and Kahneman 1986). During editing, common components across options were cancelled out and alternatives that were dominated by others were eliminated.

Tversky and Kahneman initially tested their theory by altering the wording of optional gambles presented during laboratory experiments in order to present same problem in terms of gain or loss. In testing the theory beyond its psychology and economic roots, framing has since been broadened by other researchers to include additional changes in the contextual clues of the decision environment that trigger a different approach to evaluating the information at hand (Jones 1994, 81). Geva, Astorino-Courtois, and Mintz (1994, and Astorino-Courtois 2000) used experiments to look at two different forms of framing in a foreign policy context. They first shifted the reference against which alternatives were evaluated in order to induce frames of gain and loss. They then separately tested the effects of cueing different dimensions of a single, multidimensional problem. Jones et al. (1998) tested a framing effect that looked for different responses based on whether a choice was offered between two options or whether an opportunity was offered to adopt or reject a single option.

Prospect theory also points out that decision making is not a cold science. Jervis (2004, 163) argued that this theory taps into the fears and gratifications that are part of the subjective well-being arising from everyday human life. He explained that there is powerful insight into human nature in prospect theory's prediction of *loss aversion*: that a given loss based on a perceived point of reference brings more psychological harm to a given individual than the same-sized gain produces in gratification. Kahneman and Tversky's (1979) non-linear value function forms the basis for this and related phenomena, such as the *endowment effect* where value increases with possession.

Several political scientists have used prospect theory as a lens through which they have examined historical political decisions (Farnham 1992, McDermott 1992, Levy 1992b). However, others have raised questions over whether the conditions assumed by this laboratory-based theory translate so easily into the real world of politics. In actual decisions, options and their likely risks and payoffs are not found by some to be spelled out as clearly as the theory expects (Jervis 1992). Such decisions are often the function of a group process, as opposed to the individual decision maker who is the focus of prospect theory (Shafir 1992). Also, vague uncertainties characterize most problems in the real world, as opposed to more exact probabilities in theoretical or constructed situations (Levy 1992b). Subsequently, Boettcher (1995, 318-9) warned of the inherent differences and associated issues with numerical and verbal expressions of probability, with numbers conveying greater precision and authority and words being affected by the degree to which the outcome is desirable.

Finally, Frisch discussed three reasons why individuals might treat a problem differently for reasons not related to prospect theory (1993, 409). These insights can serve as a standard for evaluation of previous and future research claiming to demonstrate framing effects. First, a perceptual illusion can cause decision makers to treat two problems in different ways, even though they later can recognize the problems as equivalent. Second, differences in objective interpretation of detail-rich scenarios can lead to dissimilar choices because different details are focused upon. Third, differing emotional reactions can also lead to diverging choices. Frisch concludes that differences in choice behavior under any of these conditions should not be attributed to prospect theory. She also offers a test to see if prospect effects are at the root of a choice variation: individuals viewing the same problem presented in different frames will remain convinced that they should not be treated in the same manner even when presented with the two cases side by side (Frisch 1993, 409).

Despite challenges such as these, McDermott highlighted multiple advantages to the application of this theory in the study of international relations (2004, 290). Chief among these benefits was that prospect theory offers a different and valuable perspective providing insight into the microfoundations of a decision process. Additionally, this theory uniquely highlights the importance of loss in decision makers' determinations of value and utility, points to the importance of the situational context of a decision, and offers a model that focuses on how value changes over time and tradeoffs are made between options offering different benefits and costs.

Given that war can be viewed as the quintessential setting of gains and losses, the application of prospect theory to the decisions under consideration in this proposal seems highly appropriate. Shaw (2005) called risk the "currency of Western warfare," providing further rationale for consideration of this theory. Indeed, considerations of risk take center stage in wartime when targeting occurs under conditions where civilian casualties are likely, international law constrains choices, and decision makers operate from their own domains of gain or loss. Smith (2008, 144) extends Shaw's concept of currency and points to warfare as an "economy of risk" where political risks and "life risks" are assigned values and traded off against each other. Smith's two categories of risk can be expanded and supplemented with others that are inherent in targeting operations. These are not all independent types, but are often related due to the nature of the security-harm dilemma. Some of these multiple dimensions of risk are as follows:

- *National-security risk* when a high-value target is bypassed, not attacked, and survives to harm a state's forces or people another day.
- *Force-protection risk* of expending the lives of a state's own military forces to attack a target, only to have the target survive, not be present, or not be the target expected.
- *Humanitarian risk* of harming civilians in the area if the target is attacked.

- *Political risk* of domestic and foreign political backlash if a high-profile target is *not* attacked when the opportunity existed.
- *Political risk* of domestic and foreign political backlash for approving the attack if a larger number of civilians are killed, as well as domestic and foreign political risk if a high-value target is allowed to be attacked.

The consideration of risk is carried forward into the next chapter and represented in the targeting decision model described there. However, the ensuing tests of the model will only vary humanitarian risk, while holding the other types constant.

## SUMMARY

This chapter has pointed toward the key considerations of a model of wartime targeting decisions. Civilian casualties, international standards of how to fight, individual decision making, context in the form of prospects for success or failure, and risk will all play substantial roles in the theoretical expectations of how these decisions are made and what choice results. How such a model is constructed and how it incorporates these considerations will be explained next.

# CHAPTER III

# MODEL, SCOPE, AND METHODS

Some targeting decisions make government officials face a tough choice--a dilemma that pulls them between two undesirable options. Choose to attack, and national security may well benefit at the expense of civilian lives and livelihoods. Choose not to attack, and civilian lives are likely spared, but at the cost of whatever contribution a successful attack would have made toward winning the war. This chapter will first model the decision that results in this unenviable situation, then model the process by which the choice is made. The research questions that flow from the model will then be provided. Following this, the portions of the model to be tested and the methods used for testing will be briefly overviewed, with more specific hypotheses and design information included in later chapters dedicated to individual tests.

## MODELING OUTCOME AND PROCESS

Two separate views of the model are needed to best describe the expected content and mechanism of a target planning decision. First, the significant inputs to these decisions and the important characteristics of the decision environment will be assembled into a structural or outcome view that seeks to predict the choice outcome that will result given a certain set of inputs. Second, a process view will be constructed by adapting the Cognitive Calculus model of decision making to describe how these various contributions are expected to be integrated into a choice by the decision maker. Both the outcome and process views describe different perspectives of a single model.

Ford et al. (1989), in their review of decision-making research using process-tracing methods, highlight the difference between structural and process views of the model. Structural models focus on the relationship between the inputs to a decision and the resulting choice. This type of model is very common in systems-level international relations research—both statistical analysis of historical data and game theory are based on this approach. However, while structural, or outcome, approaches can be used to infer the underlying decision mechanisms, process models specifically seek to look at the cognitive steps that lie between the information inputs and the choice outcome. Process models seek to answer the questions, “How?” and “Why?” Just because two individuals make the same choice does not mean that they arrived at this decision in the same way or for the same reasons.

The targeting decision model operates at an individual level of analysis in order to focus on discrete targeting decisions. As described in the previous chapter, this choice of level has not been frequently made in IR research, where models have most often sought to explain interactions between states. Nor does this targeting decision model depend on the typical rational-choice approach that has been the foundation of most state-on-state analyses. While the model expects the use of a cost-benefit calculation, it also anticipates that the relevancy or weight of the information used will vary in accordance with the context of the decision. This section will then conclude with the specific research questions for which answers will be sought through tests of this model.

**An Outcome View of the Targeting Decision Model**

Inputs into airstrike targeting decisions can be broken down into *information* and *context* components. An initial taxonomy of these considerations is shown in Table 3.1. This list is substantial, testimony to the complexity of the decisions it is intended to characterize. The information components make possible the determinations of cost, benefit, and proportionality that are called for by Just War tradition and international law. Benefit information helps determine how much the target is worth and the likelihood of successfully destroying it. Is it long-sought enemy leadership or a relatively common weapon system? Is it likely to be at its last known location? How heavily protected is it? Cost information focuses on the number, gender, and age of the civilians at risk, the probability they will be harmed by the attack, and the domestic, war-zone, and international political ramifications from previous civilian casualties. As part of the decision calculus, the context components bring in other considerations that can affect how the cost and benefit information is processed. These include time sensitivity, the frame imparted by the prospects for success in the conflict, and the emotions of the decision makers.

In situations where attacking the target is also likely to harm civilians, these inputs flow into a decision that can be characterized as a dilemma. As depicted in Figure 3.1, this choice forces a tradeoff between the two competing preferences of protecting national security and avoiding humanitarian harm. Optimally, the decision maker would be reasonably expected to desire the realization of *both* preferences, yet the construct of the problem and the available choice options prevents this outcome. This poses a

**Table 3.1**
**Airstrike Targeting Decision Inputs**

I. INFORMATION - EXPECTED TARGET BENEFIT

A. Target Value
1. Legality/Permissibility: law of war; rules of engagement
2. Type: leadership/combatants/weapon/communications/etc.
3. Effectiveness (based on political-military objectives)

B. Probability of successful strike
1. Reliability of target identification (intelligence)
2. Target hardness (ability to withstand attack)
3. Target presence and persistence
4. Constraints on attack (weather, rules of engagement, weapon availability, etc.)
5. Technical feedback from previous/similar attacks

C. Indirect, political benefits of previous/future successful attacks
1. Feedback from domestic sources (public/media/opposition, etc.)
2. Feedback from international community (governments/populace)
3. Feedback from "battleground" country (local government/populace)

II. INFORMATION - EXPECTED CIVILIAN CASUALTY COST

A. Impact of civilian casualties
1. Number predicted killed & injured
2. Number of women & children within total (amplification factor)
3. Confidence in noncombatant-status (discount factor)
4. "National partiality" (discount factor)

B. Probability of collateral casualties
1. Presence of noncombatants
2. Geometry and engineering of target area: layout/composition of structures, etc.
3. Attack parameters: time of day, weapon & fuzing, etc.
4. Feedback on accuracy of past estimates

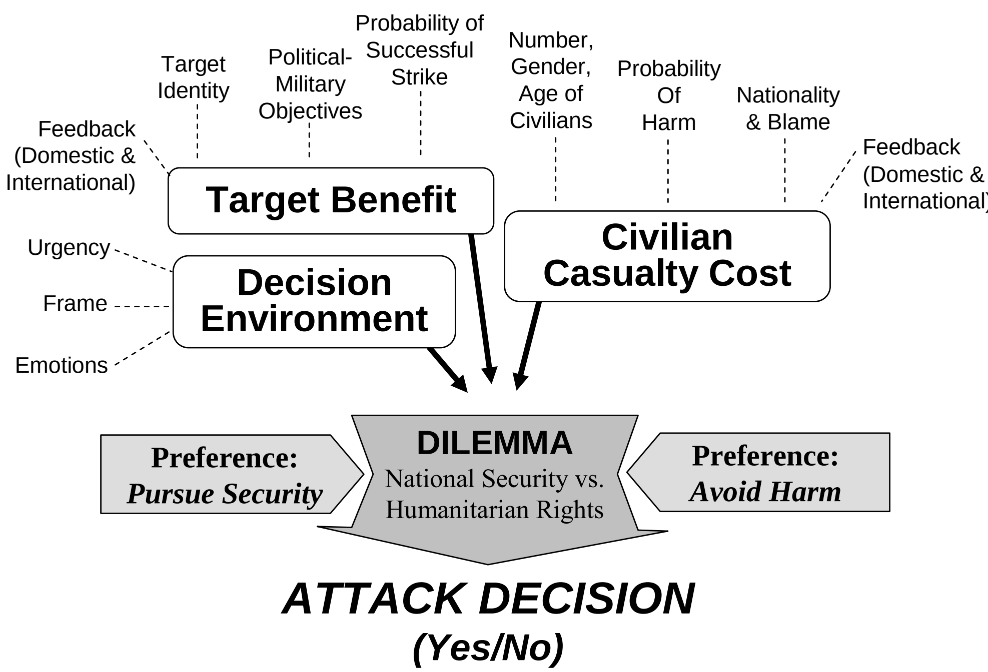
C. Indirect (social & political) costs of previous/future collateral casualties
1. Feedback from domestic sources (public/media/opposition, etc.)
2. Feedback from international community (governments/populace)
3. Feedback from "battleground" country (local government/populace)

III. CONTEXT - DECISION ENVIRONMENT

A. Time sensitivity/urgency
B. Prospect for success in conflict
C. Emotions (anger, fear, frustration, etc.)

different kind of decision-making challenge than the choice between two alternative approaches that both seek to maximize a single set of preferences. An example of this alternative kind of choice is a decision to either employ diplomacy or to switch tactics and use economic sanctions to convince another nation to alter its policy. Such a decision would likely be based on whichever approach was expected to best contribute to securing the desired policy change. Instead, a targeting dilemma holds two incompatible preferences in tension, unable to fully satisfy both, yet requiring that they both be considered in the taking of a single decision.

**Figure 3.1**
**Targeting Decision Structure**



Furthermore, the potential costs and benefits within the dilemma are expected to be weighed differently depending on the context factors present in the decision environment. The impact of time constraints on decision-making behavior was the first context factor included in the model. The press of time has been highlighted as a factor limiting attention and information use. Goldgeier and Tetlock (2001) name it as one of their top five agenda items for future decision-making research. Whether in a military command center or the upper echelons of the civilian government, time demands are expected to be high. The second factor was prospects for success. As used in this dissertation, this factor will address the strategic success of winning the conflict, not the tactical success of winning a battle. As described in Chapter II, researchers have found that frames of loss and gain affect risky choice. This dissertation will test the application of prospect theory to the targeting dilemma. The existence of this relationship is supported by the review of the literature on conflict and civilian casualties, which pointed to states causing more civilian deaths in wartime when those states are in the domain of loss.

The last factor listed was emotion, expected to be prominent in the life-and-death considerations of war. Research has shown that negative emotions can impact both the choice and how it is formed (Geva and Skorick 2006; Geva, Redd, and Mosher 2004). These three factors, time, prospects for success, and emotions are three contextual inputs that are appropriate and interesting in the setting of targeting decisions. These three factors are also incorporated within the process view of the model that is described next.

However, as will be explained, only prospects for success will be tested in this initial investigation based on the model.

While the targeting decision model has assumed that ethical and legal norms predominate in the determination of cost, it is also likely that strategic considerations play a significant role as well. Strategic concerns would also drive an objective of minimizing civilian casualties, but for the sole reason that killing civilians can result in the attacking side having to expend more military lives and resources to achieve its objectives. One way this can occur is through the generation of enmity toward the attacking force. This hatred can lead to additional recruits for the opposing forces, strengthen the resolve of the opposing force, and reduction of any assistance that had been forthcoming from the populace. The end result can be the necessity of the attackers fighting harder and longer, with an associated increase in casualties and expenditures, that would otherwise have been the case.

As far as their role in the model, strategic and humanitarian costs are very similar in their effects in the targeting decision model, although they arise from different types of concern. Given this, a simplifying assumption in this research is that the costs in the model are humanitarian in nature. In the case of the United States, this assumption is supported by the extensive training required by the DoD and the individual services for all military members regarding the requirements of the law of war and their duty to uphold those legal norms (U.S. Department of Defense 2006). Blumenfeld’s interviews (2006) offer support for this assumed role of norms in the case of Israel.

**Process View of the Targeting Decision Model**

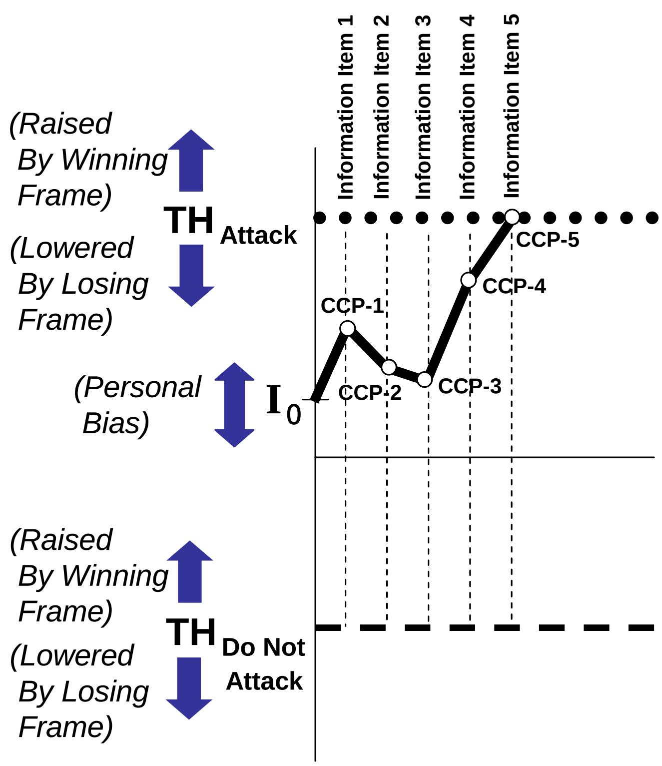
The targeting decision process description drew from the Cognitive Calculus model to explain the process through which a decision maker determines a targeting choice. This selection was made because of the unique features of the model that allow it to reflect the effects of cost, benefit, time, emotion, and the framing inherent in prospect theory.

Cognitive Calculus assumes that decision making is an online process, meaning that information is continuously incorporated into an internal, ongoing tally that continues until it crosses one of the two decision thresholds, stopping the process and setting the choice (Geva, Skorick, and Mayhar 2000). This tally is known as the *cumulative choice propensity* (CCP*)* and reflects both the decision makers' inclinations toward one or the other of the final choice options, as well as the strength of that conviction.

Cognitive Calculus offers an alternative viewpoint to that of expected utility, which often assumes that all necessary information is available, used, and simultaneously processed in order to calculate costs and maximize benefit. Instead, the online assumption of Cognitive Calculus also implies that an individual's CCP can cross a decision threshold at any time, after little, some, or all of the information is taken in by the decision maker. The process-tracing features of the model were useful in determining the attention that was being assigned to target and civilian casualty information during the formation of the decision, as well as in the final choice.

Figure 3.2 displays the resulting model with the key Cognitive Calculus features clearly indicated. The horizontal axis marks time as information items are sequentially processed. The vertical axis tracks positive and negative CCP levels. The *attack* and *do-not-attack* decision thresholds ($TH_{Attack}$ and $TH_{Do\ Not\ Attack}$) are respectively positioned in the positive valence region above the horizontal axis and in the negative valence region below the axis. The thresholds may be symmetric or asymmetric around the axis. Two factors that can affect threshold positioning are negative emotions and prospects for

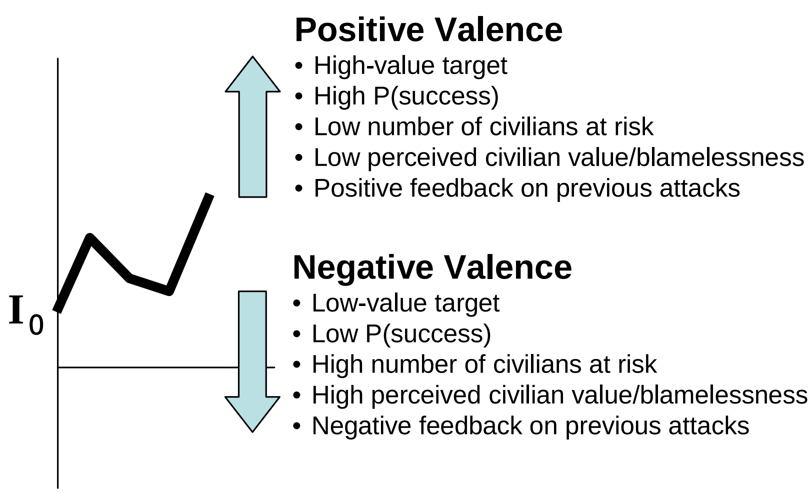
**Figure 3.2**
**Targeting Decision Process**



success, both of which will be explained further at a later point in this section. The CCP begins at each decision maker's own $I_{0,}$, with the position of this starting point expected to be determined by personal bias and other factors. For example, military officers were found previously by Semmel and Minix (1979) to be more willing than ROTC cadets and civilian students to employ force to resolve foreign policy crises in an experiment, so in this targeting scenario the military and defense personnel could be expected as a group to have a positive $I_0$. From the starting point, incoming information can then incrementally push the tally upwards toward the *attack* choice or move it downward toward the *do-not-attack* option.

In Cognitive Calculus, the amount and direction in which items of information move the CCP is determined by four factors: valence, relevance, reliability and redundancy (Geva, Skorick, and Mayhar 2000). In the process view of the targeting decision model, information supporting an *attack* decision is assigned a positive valence and moves the ongoing tally closer to $TH_{Attack}$. Examples of these kinds of inputs might be a information about a target's high value or an estimate of little or no civilian casualties. However, information that points to a *do-not-attack* decision is considered to possess a negative valence and shifts the CCP toward $TH_{Do\ Not\ Attack}$. Inputs reflecting a target's low value or a high estimate of civilian casualties would be expected to be negative-valence information. These and other types of targeting decision inputs are listed in Figure 3.3 under their matching valence. The amount of shift in CCP generated by a single item of information can be decreased by an amount determined by the product of the perceived relevance, reliability, and redundancy of the information, each taking values between 0 and 1. In this way, information that is extremely pertinent or only somewhat applicable, that engenders high or low confidence in its accuracy, or that is unique or duplicative impacts the decision process appropriately. The determination of relevance, reliability, and redundancy is a matter of cognitive perception and judgment on the part of each individual decision maker.[5]

**Figure 3.3**
**Valence in Targeting Decision Process**




In the model, the distances between $I_0$ and each of the thresholds represent the amount of change in CCP that is required in each direction to cause the associated decision to result (Geva, Skorick, Mayhar 2000). For example, if $I_0$ and the *attack* threshold are positioned close to each other, relatively little information with a positive

[5] Those these parameters can be established empirically and at times are similar among members of a group who share similar values (Discussion with Nehemia Geva, Texas A&M University, September 25, 2009).

valence would be required to secure a decision to attack. Once the CCP reaches the threshold associated with either attacking or not attacking the target, the individual has determined his or her choice and stops the process, including information gathering. Additionally, the sequencing of information items matters. A string of items with the same valence can cause the CCP to reach a decision threshold much more quickly than if the same number of items have mixed valences. Figure 3.2 depicts a short history of CCP values that contains two negatively valenced items and three with positive valences. While the CCP is a real-time indicator of support, records of sequential CCP measurements can also be used in post hoc analysis to recreate a trace that shows the history of the choice process. This process tracing capability was used in this investigation of the targeting decision process.

The effects of contextual inputs of time, emotions, and prospects for success can also be easily reflected in the Cognitive Calculus model. An unhurried timeline affords decision makers the opportunity to access more information, unless their CCPs cross a decision threshold and stop the process. Constraints on time can truncate information acquisition, forcing final choices to be made before a threshold has been crossed, and possibly with different results than if the decision process had been completed.

Negative emotions have been shown to affect decision threshold positioning and other facets of the Cognitive Calculus model (Geva and Skorick 2006; Sirin and Geva 2006; Geva, Redd, and Mosher 2004). Emotions such as anger have tended to lower a decision maker's threshold for the more aggressive of the two choice options. Decision makers have become less concerned about the reliability of information and decisions have come faster. Furthermore, negative emotions have increased the relevancy of information with the same valence as the more aggressive decision threshold, further hastening the corresponding decision.

In the targeting decision model, prospect framing is expected to shift threshold positioning, but this alone does not determine the choice. The distance of a threshold from $I_0$ affects the likelihood of adopting the associated option, given a particular set of information. Depending particularly on the valence, the information available can either move the CCP toward one threshold or the other. Hence, even a short distance from the starting point to a threshold does not make that choice more likely if the valence of the information is in the opposite direction. However, given the same set of information, less information may be necessary for a decision to result. This will particularly be the case if the information is of high relevance.

When making targeting decisions, both thresholds will be shifted upward whenever decision makers perceive they are winning the conflict. Keeping in mind the interdependencies just discussed, this will cause $TH_{Attack}$ to be positioned farther from $I_0$, marginally decreasing the likelihood of an *attack* decision. It will also cause $TH_{Do\ Not\ Attack}$ to be closer, increasing the probability the CCP will reach it first, holding the information valence and relevancy constant. A *winning* frame also will increase the relevancy or weighting of information with a negative valence, marginally supporting a *do-not-attack* decision. Alternatively, $TH_{Attack}$ will be moved closer to $I_0$ and $TH_{Do\ Not\ Attack}$ further away when target planners believe they are losing, placing them in a frame of loss and increasing the relevance or weight of positively valenced information.

This will induce them, on the margin, to be more likely to accept the risk of civilian casualties and press the attack. Thus, depending on the positions of the thresholds, one or the other choice options can be favored from the outset because the CCP tally is relatively closer to triggering the selection of that option and information favoring that alternative will be perceived as more relevant and given more weight.

In these ways, the targeting decision model is capable of describing how targeting decisions are made by individual decision makers based on specific sequences of information within a particular set of circumstances. Information is serially processed as it arrives by decision makers and incorporated into an online CCP tally depending on the characteristics of the information item. Decisions are made when this tally crosses the corresponding decision threshold, which stops the process. Because the positions of these decision thresholds are adjustable, the model can incorporate the importance of loss or gain in this wartime context, as well as other contextual inputs. Thus, the model explains choices in very complex, information-rich environments without relying only on cost and benefit analyses.

**Research Questions and Propositions**

These model views define the key characteristics of the targeting decision problem and enable the addition of more detailed questions and propositions that provide further focus for this dissertation. In order to gain insights into the more general query about how targeting decision are made in the presence of competing preferences, the model points to the importance of both information and context, as perceived by the decision maker. In each case, modeled aspects of the decision process raise specific questions for this research.

Looking first at the informational inputs to targeting decisions, it is apparent that there are two types of relevant information: target and civilian casualty. Looking at these types separately and interaction prompts the following questions and propositions:

- *Does support for attacking the target vary with the benefit gained?* Given the wartime setting and the military members making the choice, the decision makers will be able to differentiate the contribution of the target toward eventual victory in the conflict. The greater this benefit, the more likely that the target will be attacked.
- *Does support for attacking the target vary with the absence of likely harm?* Because the humanitarian constraints on warfare are well accepted in modern democracies, different levels of cost in civilian casualties will also be meaningful to decision makers. The greater the harm, the less likely that the target will be attacked.
- *Does attention to likely harm vary with the target's benefit?* The dilemma between the protection of national security and the avoidance of humanitarian harm will not always be resolved in the same way. Given the military context of the decision, however, humanitarian harm should matter more when the benefit offered by striking the target is meager than when it is great.

Next, the informational inputs were modeled as being processed serially by the decision maker and the number of information items required to reach a decision as dependent on the position of $I_0$ and the decision threshold.

- *Does the sequence of the inputs matter?* Because the two type of information have different valences, decision makers should be more likely to make the choice that is supported by the information type that they choose to view more frequently and earlier in their search.

- *When do decision makers use more of one type of information than another?* The model suggests that prospect frame affects information relevancy. As a result, decision makers should assign more weight to one type of information or the other and choose to view more items of that type based on whether they consider their forces to be winning or losing.
- *When do decision makers not view all the information and make an early choice?* The model expects that when the CCP reaches one of the two decision thresholds, the information gathering and choice process stops. Therefore, early choices should result whenever a combination of information valence and relevancy, as well as threshold positioning, has led the decision maker's CCP to reach the corresponding threshold.

The model also points to the contextual inputs as able to shape the decision outcomes. In this particular investigation, the prospects for success are expected to affect the risk attitudes of decision makers and shape their decisions.

- *Does a winning or losing frame affect support for the attack?* The model suggests that the prospect frame will influence decision makers' risk attitudes and increase the relevance of one or the other type of information. As a result, decision makers in a winning frame should more risk averse and give more weight to harm information and less to target information, leading to a marginally higher probability of deciding not to attack. This relevancy ordering, risk attitude, and the resulting choice should be reversed in a losing frame.
- *Does a winning or losing frame affect support in high stakes dilemmas?* When facing both high costs and high benefits, the decision maker should not be expected to make a choice based solely on a cost-benefit comparison. Therefore, the risk attitude, type of information that is more relevant, and the decision threshold that is closer should play a large role in determining the choice. When in the domain of loss and facing this dilemma, decision makers should be more risk acceptant and show more support for attacking than when they are in the domain of gain.

The pursuit of answers to these questions required methods that look not only at the decision outcome, but also illuminated the process that led the decision maker to that choice. How this was done is explained in the following section.

## SCOPE AND METHODS

Three individual tests were used to initiate the process of explicating the targeting decision model. The first two were experiments, each with unique features to enable specific analyses. The last was a statistical analysis of historical data. How each was tailored to illuminate specific aspects of the targeting decision process is explained below.

To explore these research questions, this dissertation employed a multi-pronged design that used decision-making experiments as its main thrusts. The investigation also leveraged statistical analysis of original military attack and civilian casualty data from the second Intifada to point to evidence of the targeting decision process at work in recent history. This section will briefly introduce both the experimental and observation-analytical approaches, while leaving more detailed descriptions to the dedicated results chapters that follow.

### Experiments

An experimental approach was particularly advantageous for an investigation of targeting decisions for two reasons. First, actual military targeting data are closely held state secrets and the decisions that result are rarely discussed in the open. Thus, closely studying the historical choices of government officials in the process of targeting was not feasible. Second, experiments permit exploration of the micro-foundations of a decision process. They do this through the use of controlled manipulations and the power of randomization to control for additional influencing factors (McDermott 2002). Given the desire to carefully dissect a particular class of difficult decisions, an experimental approach was appropriate. It is not uncommon for scholars to expect experimentation to offer poor external validity. However, this dissertation sought to bolster the generalizability of its results through the use of senior military officers and defense civilians as participants (see Mintz, Redd, and Vedlitz 2006; Chin, Bond, and Geva 2000). These individuals were drawn from the senior-most level of professional military education offered by the U.S. Air Force. As students and faculty, they had received and given specialized education in the law of war and the DoD targeting process. Furthermore, they were all leaders in their respective services and operational units and fully accustomed to the military approach to decision making.

Two experiments were designed. Both incorporated the same aspects of the outcome view of the model. Because of the nature of the experimental method and its emphasis on control, the experimental tests were limited to the exploration of three manipulations of factors drawn from this model. Because of the significance assigned by the Just War tradition and international law on target value and the number of civilians put at risk, variations in levels of both of these informational inputs were included in the research design. The third factor, prospect frame, was selected from the context inputs because it offered an interesting opportunity to test the findings of Downes (2007) in a new setting. He implicated several characteristics of war as likely to increase the killing of civilians during a conflict. Some of these characteristics fit well within the application of prospect theory incorporated in the targeting decision model. For example, wars of long duration and high military casualties are also wars that would be likely to be perceived from the domain of loss, whereas fighting that resolve relatively quickly and with low costs would be expected to place governmental leaders in the domain of gain. The decisions that are expected to result based on prospect theory's emphasis on risk acceptance and aversion align well with the results of Downes (2007).

Both experiments also addressed the model's process view, but permitted different portions of the decision process to be explored by varying the way that information was able to be used by the participants. In the first test, the flow of information was pre-determined and not permitted to vary. In addition, the all information had to be reviewed. In the second test, participants were given greater control over the type, sequence, and number of information items they viewed before making a decision. The first approach enabled cross-participant comparisons as they all received the same informational inputs in a fixed order. The second design enabled investigation of issues involving the sequencing and relevance of information, as well as the speed of decisions. More information about each design will be provided when the associated experiment is discussed in detail in its respective chapter.

The two experiments were conducted in Fall 2008 with volunteer participants drawn from among the mid- and late-career military officers and civilian Department of Defense (DoD) employees who were enrolled or teaching in U.S. Air Force military professional education programs.[6] Preliminary tests of this experimental approach were completed previously using a similar scenario, several of the same variables, and a pen-and-paper format. These pre-test investigations used college undergraduates, military officers, and DoD civilians as participants (Roblyer 2008). The results were supportive of employing this methodology as an insightful means of investigating this decision-making process.

In this most recent round of experiments, all participants were presented with a hypothetical situation in which an airstrike by U.S. military forces was under consideration in order to attack a wartime target in a fictitious overseas country. The scenario was built to ensure that sufficient information was presented for a decision, but not so much input that participants would be overloaded with considerations. Unlike the prototype experiments' pen-and-paper format, the new experiments were executed using Infinity Design's Dec-Tracer web-based platform.[7] This enabled detailed control of experimental parameters, as well as close monitoring and relatively unobtrusive measurement of participant actions.

Both experiments employed the same 2×2×2 between-groups factorial design, manipulating each of three independent variables between two different levels, and testing participant responses under each of the eight combinations of those variables. Both experiments permitted study of the decision outcomes. The outcome dependent variables captured participants' final choices about support for the proposed airstrike.

---

[6] Thanks go to Air University, a U.S. Air Force education command, for access to Air Command and Staff College in-residence students and faculty, and to Air War College in-residence students, distance-learning students, and faculty.

[7] With thanks to Uri Geva for developing the platform and making the modifications necessary for these experiments.

This was done using both a binary choice variable, ATTACK, and a more sensitive, scaled measure of support, INTENSITY.

Process parameters were used to map the process used by the decision makers. While unique design features in each of the two experiments enabled differing measures of the decision process, a key shared measure, CCP_REPORT, captured participants' CCP as they worked through the scenarios. These measurements were taken by asking which direction they were "leaning" and the strength of that conviction at multiple points while they read information and proceeded toward their decision. These CCP self-reports were useful in determining the point effect of the manipulations, as well as in reconstructing average CCP traces of participants in each of the experimental conditions. Additional process parameters will be described in the chapters dedicated to the experiment in which they appeared.

The independent variables used were TARGET, HARM, and FRAME. The first of these, TARGET*,* established the importance of the target to achieving the war's political and military objectives and was experimentally manipulated between a low and a high level. The low-value target was a meeting of low-level enemy operatives against which a successful attack would only disrupt enemy activity in the immediate area of the country where the war was being fought. The high-value target was a meeting of deputy commanders from the enemy forces. Destruction of that target would disrupt enemy activity across the entire country. Participants were informed of both the target and the expected impact of a successful attack.

Independent of the variation in target value received by a participant, additional information was also provided about the target, but was held constant across all the experimental conditions. This information included the probability of successfully hitting the target, the reliability of the intelligence that prompted the call for an airstrike, and the legality of attacking the target. While these information items were not varied in these experiments, they were included in accordance with the theorized structural model of this decision process. Also, all of the additional items provided support for the proposed attack.

HARM, or the number of foreign noncombatants at risk of being killed during the attack, was the second independent variable and was set at either 5 or 30 civilians. These numbers were grounded in the scenario by using background information specifying recent civilian casualties in the war. Similar to the presentation of target information, additional inputs about civilian casualties were also provided, but not varied between conditions. These inputs, also taken from the structural model for target planning, were the probability of harming the civilians, the reliability of the casualty estimate, and the legality of the airstrike in light of the target and casualty estimate.

The final independent variable, FRAME, was manipulated by establishing a *winning* or *losing* context for the targeting decision. This was accomplished by a scenario introduction that provided background on recent events in the war and the current assessment of the ability of enemy and friendly forces to garner local support, resupply, win battles, and inflict military casualties on the other side. As an example, the winning frame in the experiments stated:

*American forces have clear superiority in firepower and are considered to be close to defeating this stubborn insurgency. The logistical supply line between the terrorists and the rebels seems to have been broken, with the rebels able to mount only weak offensives in the past several months. [Local] and U.S. forces continue to consolidate territorial holdings and popular support around all of the major regional centers. U.S. military casualties have been sharply reduced, with a lower casualty count over the past six months than during any similar period since the start of the conflict.*

The eight experimental conditions resulting from the combinations of the above three independent variables are shown in Table 3.2. It should be noted that Conditions 1 and 5 are the strongest presentations of targeting dilemmas. In these conditions, not only are the target value and civilian casualty estimate closely matched, but they are both set at the high level.

**Table 3.2**
**Experimental Conditions Created by Factors and their Values**

| | Winning Frame | | Losing Frame | |
|---|---|---|---|---|
| | High Civilian Casualties | Low Civilian Casualties | High Civilian Casualties | Low Civilian Casualties |
| High-Value Target | *Condition 1* | *Condition 2* | *Condition 5* | *Condition 6* |
| Low-Value Target | *Condition 3* | *Condition 4* | *Condition 7* | *Condition 8* |

Following completion of the experiments, the results were examined using analysis of variance (ANOVA) and analysis of covariance (ANCOVA) methods. These tools permitted comparison of means between the groups of participants who received differing levels of the experimental factors. Additional specifics about these methods will be provided in the experimental results chapters.

**Analysis of Historical Data**

As a companion to the above experiments, empirical evidence of the theorized decision-making model was sought in real-world choices under wartime conditions. An opportunity to observe the targeting decision process at work in a democratic government other than the United States was also strongly desired. Historical data was located that characterized the military attacks, the civilian casualties, and the prospect frame that formed the context of the attacks associated with six years of the second Intifada, the still-ongoing conflict between the Palestinians and Israelis.

The Intifada data permitted study of a limited aspect of another instance of decision making by a democratic government in conducting military operations against adversaries which also risked harming local civilians. It was expected that Israeli government officials would regularly wrestle with issues of proportionality under *double effect* conditions and Israeli military attacks against Palestinian terrorists and militants would sometimes result in accompanying civilian casualties. Additionally, the nature of this conflict with its close proximities and long, torrid history seemed likely to have evoked changes in prospect frame for Israeli governmental decision makers as they chose whether and how their military forces would respond to terror attacks against Israelis.

The analysis was performed on an original event data set containing daily records of terror attacks, Israeli casualties from those attacks, and Palestinian fatalities from Israeli military response during the period from September 23, 2000 to December 20, 2006. It was expected that the lethality and location of Palestinian terror attacks against Israelis would significantly influence the prospect frame from which Israel would operate when deciding how their military forces would respond. A preliminary version of the data set focused solely on Israeli responses employing airstrikes, but this provided too little data to support clear conclusions because airstrikes were relatively rare events over the six-year time span. As a result, only hints of relationships between the variables could be found (Roblyer 2007). In the new data set, the response event frequency was increased by also including Palestinian fatalities from Israeli military ground operations. This expansion did not sacrifice any theoretical applicability of the data set as the presence of civilians is expected to be anticipated and incorporated into all attack planning, whether from the air or on the ground. This investigation and its results will be further discussed in Chapter VI. The results not only provide evidence of key aspects of the targeting decision model, but they also bolster the argument that the model can apply to democratic governments other than the United States.

## SUMMARY

This chapter has described the outcome and process views of the decision model developed to describe targeting decisions in the face of likely harm to foreign civilians. The outcome view focused on the external inputs expected to influence *what* choice would result. Prospect theory was the basis of predicting the outcome given specific values of target benefit, civilian casualty cost, and prospect frame. Next, the process view drew on Cognitive Calculus to look within the decision maker and explain *how* this information and the winning or losing frame resulted in particular choices.

This model served as the basis for the design of two experiments to explore the decisions of military officers and defense civilians when presented with various combinations of the independent variables. Both of the experiments varied the value of the target, the number of civilians at risk of harm, and the prospects for success. However, the first experiment provided a fixed sequence and amount of information while the second permitted participants greater control over information selection and decision timing. The specific experimental conditions that included both a high target value and high civilian casualty estimate were expected to present a particularly difficult dilemma for decision makers to consider. Various measures were developed to capture decision outcome and to explore the choice process. Several of these dependent variables, as well as more specifics about the distinctions between the two experimental designs will be described in the next two chapters. A statistical exploration of historical data was also selected to search for evidence of the targeting decision model in action in a democratic setting outside of the United States. This test will be further discussed in Chapter VI.

# CHAPTER IV

# EXPERIMENT 1: DESIGN, HYPOTHESES, AND RESULTS

As the first experiment opened, participants were presented with a description of an ongoing conflict involving U.S. forces, as well as a request for an urgent airstrike against the enemy. In the course of the scenario they were given information about the prospects for success in the war, as well as the particular target for the strike and an estimate of the number of civilians that would die if the attack occurred. By varying only the value of the target, the number of civilians, and the future prospects according to the eight experimental conditions described in Chapter III, Experiment 1 was able to display the dependencies of *attack* and *do-not-attack* decisions on these benefit, cost, and context variables. It also documented and explored the development of these choices during the scenario.

The results of the experiment show that it was able to contribute toward answering several of the research questions raised in the previous chapter. For example, participants did vary their support for attacking the target depending on its value. They did allow likely harm to civilians to affect their support for an attack. The effects of winning or losing on support for the attack and the other factors were more qualified. Yet, prospects for success did matter in the tough dilemmas that pitted a high-value target against a high estimate of civilian harm. Before describing these and other results in greater detail, this chapter will first build on the general description provided in

Chapter III and describe the details of the experiment's design and administration, including variables and hypotheses.

## DESIGN AND ADMINISTRATION

The following subsections will describe additional specifics about the variables used in this particular experiment, hypothesized relationships between the variables, and how the experiment was constructed to test these relationships. This section will also describe the participants, as well as how the experiments were administered.

### Unique Design Features

Two specific characteristics of this first experiment were unique. First, it required that all participants receive the same number and sequence of information items. Second, it collected the participants' self-reported CCPs throughout the scenario while they were forming their eventual *attack* and *do-not-attack* decisions. Together, these features enabled the comparison and analysis of choice formation. The following two paragraphs will briefly describe these features and the analysis they permitted.

Requiring a fixed flow of information meant that all participants received their assigned target, civilian casualty estimate, and prospect frame at the same relative points in their scenarios. All other information contained in the scenarios was identical in content and sequence. This design constraint permitted a clear picture of how individual information items affected each participant, without the likely confounding effects of variations in order of presentation. However, the fixed-flow requirement also meant that this experiment could not be used to explore any questions about participants' patterns of information access—a task left to Experiment 2.

The evolution of each participant's eventual choice was also followed as participants read each information item and then reported their CCP, or inclination at that moment toward attacking the target or not. These data were collected via a measure that will be further explained in the next section. The measures were then used to construct post-hoc CCP histories that differentiated the decision processes that occurred in each of the eight experimental conditions. Further more, the fixed information flow also enabled comparison of these CCPs across participants and conditions throughout the entire scenario so the effects of each experimental factor on CCP levels could be seen to wax, wane, or remain constant as the scenario progressed.

**Variables**

As described in the previous chapter, this experiment was developed around several dependent and independent variables. ATTACK and INTENSITY were the outcome dependent variables, measuring decision outcome as a bi-level yes-no choice or a scaled expression of support, respectively. INTENSITY was a composite variable constructed by joining ATTACK with the responses to a post-scenario question asking participants to mark on a 10-point scale how certain they were about their *attack* or *do-not-attack* choice concerning the proposed airstrike.

Two process parameters were also used in this experiment to study the decision process within the experiment's fixed flow of information. The first of these variables was CCP_REPORT, which captured participants' self-reports of the direction and degree to which they were leaning at a given moment in the scenario. Each participant logged 14 CCP entries, beginning immediately after the scenario introduction and repeating the assessment after each of the 13 information items.[8] Individually, these in-progress measures will be referenced as CCP-0 through CCP-13. The other process parameter used in this experiment was ITEM_TIME, designed to capture the speed at which participants moved from screen to screen while viewing the scenario script. The independent variables were limited to the three experimental factors: TARGET, HARM, and FRAME.

**Hypotheses**

Predictions formed about variable relationships included three main effects—changes in participants' behavior in response to manipulation of one independent variable. The high-value target was expected, on average, to cause a participant to lean more toward an *attack* decision than the low-value target because the deaths of the enemy deputy commanders offered substantially more tactical-strategic benefit than the deaths of two enemy soldiers. However, the high value of HARM was expected to cause participants to be more likely to choose the *do-not-attack* option than the low civilian casualty estimate because the cost of 30 civilian lives was significantly more than 5 lives. Finally, participants who believed that their side was losing the war would be more

[8] These measurements were a composite score ranging from -100 to +100 (definitely *do not attack* to definitely *attack*). Participants had been asked to enter whether they were leaning toward attacking or not at that moment. They were then directed to enter the strength of their current position on a scale of 1 to 100 (barely convinced to very definite). These two responses were then combined to form CCP_REPORT.

likely to support the proposed attack than those who thought they were winning. This was because operating from within a frame of loss would make them more willing to accept the risk of civilian casualties and more likely to press the attack than those in a frame of gain. These three main effects were cast as the following hypotheses:

- $H_1$ (Support Varies with Target Value ) – Participants will show more support for attacking the high-value target than the low-value target.
- $H_2$ (Support Varies with Absence of Harm) – Participants will show less support for attacking the target when presented with the high civilian casualty estimate than the low estimate.
- $H_3$ (Support Varies with Prospect Frame) – Participants will show more support for attacking the target when they are in the losing frame than in the winning frame.

Additionally, an interaction of these experimental factors was also expected to be statistically significant. The interaction described the cumulative effect of benefit and cost in final decision outcomes:

- $H_4$ (Sensitivity to Harm Varies with Target Value ) – Participants with a low-value target will be more sensitive to differences in civilian casualty estimates than those with a high-value target.

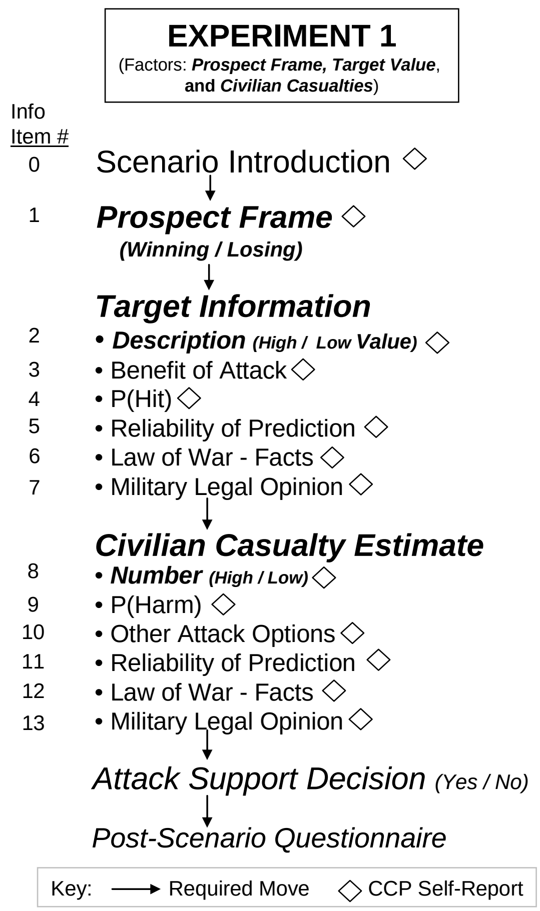
This interaction was joined by a hypothesis based on an a-priori contrast that described the anticipated behavior when participants were faced with the strongest dilemmas among the eight experimental conditions. Conditions 1 and 5, where both the target value and civilian casualty estimate were high, will be referred to as the high stakes conditions in this report. Under these high stakes conditions, they comparison between cost and benefit was difficult because the relative proportionality was not obvious. Therefore, it was the prospect frame that was expected to drive participant decisions. In the winning frame, participants were expected to be more averse to the risk of civilian casualties. However, in the losing frame, the risk of harm was anticipated to hold less sway:

- $H_5$ (Influence of Framing on High Stakes Conditions) – If participants are confronted with the high target value and high civilian casualty estimate, they will be more likely to support the attack if they are in the losing frame rather than the winning frame.

**Research Instrument**

In this first experiment, participants read a scenario that provided the information available about the context, target, and civilian casualty estimate in a predetermined order, as shown in Figure 4.1. All the participants received all the items of information. They self-reported their CCP after reading each of the 14 information items in the scenario (see Figure 4.2). At the end of the scenario, all participants then recorded their decision as to their level of support for the proposed attack and answered several post-scenario questions used to collect additional data. The computer automatically tracked time per information item.

**Figure 4.1**
**Flow of First Experiment**
**(Fixed Information)**



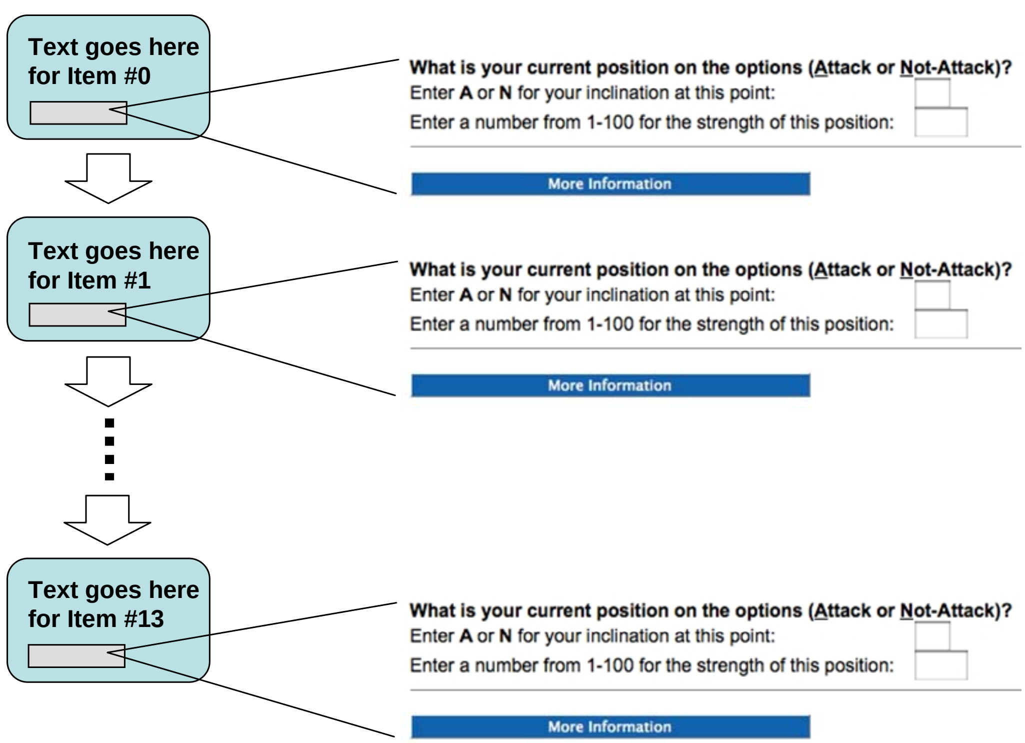

## Administration

Over 195 military officers and DoD civilians took part in the experiment as anonymous volunteers while attending senior-level professional military education.[9] At the request of the U.S. Air Force education administrators, the experiment was

[9] The officers were majors, lieutenant colonels, and colonels. Civilians were mid- and upper-grade career public servants. The mean time in service of both groups was approximately 15 years. More information about their qualifications is available in Chapter III.

advertised via e-mail messages to students and faculty. These potential participants were invited to take part in the study by selecting the link provided to the *Dec-Tracer* web site. Individuals who agreed to participate were randomly assigned by the computer to one of the eight experimental conditions and their scenario began immediately thereafter. Participants received no remuneration, nor were there any negative consequences for opting out. After removal of several incomplete responses, 187 cases remained and constituted the main sample used for analysis, although post-scenario questionnaire response analysis was based on a slightly smaller subset of 180 cases.

**Figure 4.2**
**Placement of CCP_REPORT Measures in Information Flow**



Participants initially read a set of instructions, then proceeded directly into the scenario screens, alternately reading and then entering their in-progress CCP. At the end of the scenario they responded with their *attack* or *do-not-attack* decision, then answered an 11-item post-scenario questionnaire. Most participants completed the experiment in approximately 10 minutes. The experiment instructions, scenarios, and questionnaire are included as Appendix A.

## RESULTS

This section will first provide evidence of the validity of the experimental instrument by briefly presenting the results of manipulation checks built into the post-scenario questionnaires. Next will follow a summary of the analyses of the participants' final decisions using the two outcome dependent variables. Third, the focus of the analysis will shift from decision outcome to process with the reporting of insights drawn from participants' in-progress CCPs. Also, it should be noted that the time measurements taken during the decision process will not be reported because they were not sufficiently controlled and could not be reliably analyzed.[10] This issue will be further discussed in the concluding chapter.

[10] ITEM TIME varied across a very large span ranging from seconds to tens of minutes. Higher values occurred frequently enough that attempts to discard outliers or to transform the data were insufficient to tame the data. It appears that the cases with large time measurements resulted when participants' attention was temporarily diverted to other tasks, but then later returned to complete the experiment.

**Manipulation Checks**

Several checks of the effectiveness of the experimental manipulations provided evidence that these experimental results and their interpretations were internally valid. First, post-scenario questions verified that the participants had read and understood the TARGET and HARM manipulations in their scenario. Eighty-eight percent of participants correctly recalled the target and 96% accurately reported the civilian casualty projection presented in their scenario. However, only 78% of participants correctly identified whether the friendly forces were winning or losing in their scenario, indicating an issue with how the FRAME manipulation had been received. Participants who had been assigned to the losing frame supplied most of the incorrect answers, stating that they did not know whether the American forces were winning or losing according to the scenario. This pointed to a likely role for the participants' own experience and perceptions in weakening the FRAME manipulation. This issue will be discussed further at the end of the decision process analysis section.

Second, additional questions verified that participants understood the benefit represented by the TARGET and the cost inherent in the HARM manipulations to which they were exposed. When asked to use a 10-point scale to assess the importance of their target toward winning the war, the responses showed that the participants were aware of the value of their target. Those with the enemy leadership target, which was designed to be highly valued, entered an average rating of 7.78, while those with the low-value target of two insurgent operatives recorded a mean value of 5.43 ($F(1,179) = 62.08$, $p < .001$). Similarly, when participants were asked to use a 10-point scale to characterize the expected cost in civilian casualties when compared to the proposed target in their scenario, the participants also were aware of the cost intended by the manipulation they had received. Those with the high estimate of 30 civilian lives assigned it a mean cost score of 6.84, but those with the low estimate of only 5 civilians assessed its cost to be 5.22, on average ($F(1,179) = 20.46$, $p < .001$).

While there was no additional question that further explored the FRAME manipulation in a direct fashion, prospect frame did influence answers in the target-importance question in ways that agreed with theoretical expectations. FRAME and HARM formed an interaction on the benefit of the target ($F(1,179) = 3.67$, $p < .05$). Figure 4.3 shows how the winning frame sensitized participants to the differences in civilian casualties. According to prospect theory, those in the domain of gain would be risk averse, seeking to conserve what they currently held. This would lead them to pay more attention to the costs associated with different decision options in order to avoid high risk. This result was statistically significant, although the greatest perceived difference in target importance was only 1 point on a 10-point scale.

Yet, FRAME's influence in the question about civilian casualty cost was the opposite of that predicted by prospect theory. The interaction of FRAME and TARGET is shown in Figure 4.4, where the average participant scores in the losing frame show greater attention being given to the differences in cost than in the winning frame. This inconsistency in the operation of FRAME provided another reason, in addition to the lower recall score associated with that manipulation, to closely monitor the role of prospect frame in this experiment.

**Figure 4.3**
**Influence of FRAME and HARM**
**on Target Importance**

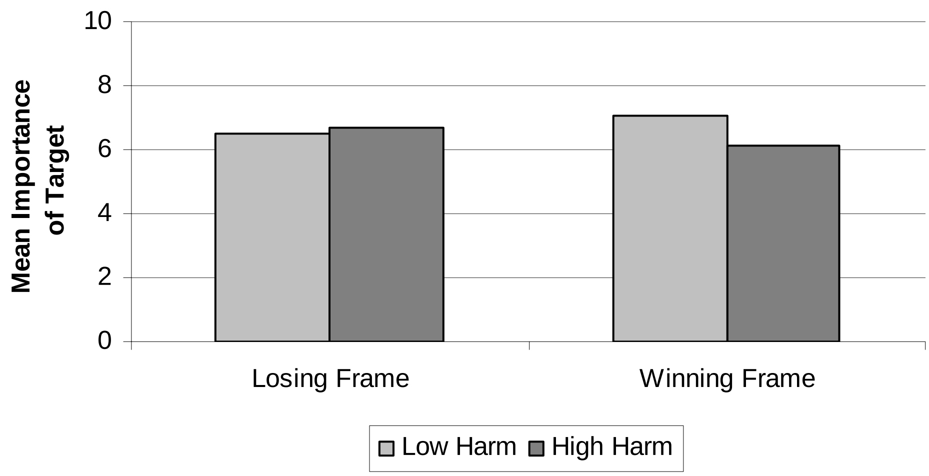
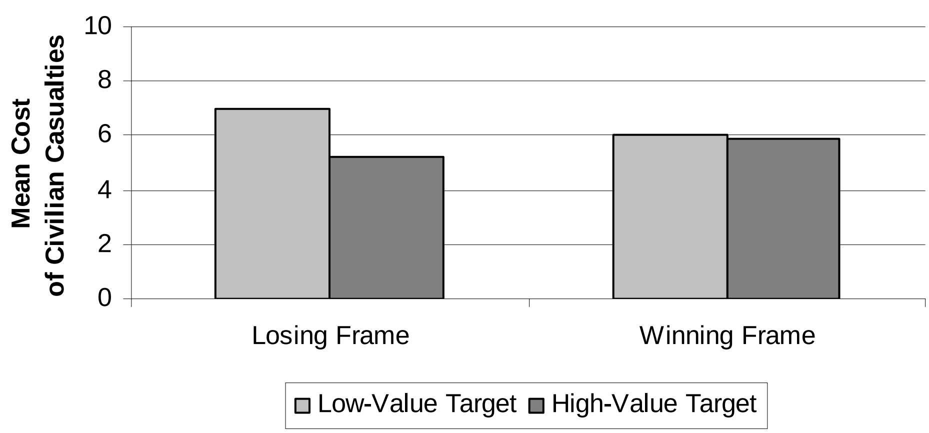



**Figure 4.4**
**Influence of FRAME and TARGET on Target Importance**



The final internal validity check verified successful randomization of the participants to the different experimental conditions. An ANOVA of CCP-0 by FRAME, TARGET, and HARM confirmed that none of these experimental factors had any significant influence on the scores reported at CCP-0. This was the experiment's first measure, occurring before any of the three manipulations had been introduced into the scenario. The result established that random assignment of participants to conditions had been successful and the average starting points within each condition were effectively the same for the purposes of the analysis.

These checks confirmed that the TARGET and HARM experimental manipulations were effective. Although the FRAME manipulation was weaker than the other two, it was still able to interact with TARGET to influence both the perceived benefit and cost of the proposed airstrike according to the scenario experienced. However, the latter interaction was not in the direction expected. The rationale for this apparent anomaly is developed later in this chapter. Finally, these checks also established that successful randomization occurred. Together, these results laid the groundwork for the analyses that will follow and encouraged special attention when interpreting the effects of FRAME.

## Decision Outcome Results

As described earlier, the decision outcomes were measured in two different ways, with ATTACK recording a simple *yes* or *no* response to participants' support for the proposed airstrike, and INTENSITY adding to that measure the level of participant certainty for each response. The analyses of these variables with respect to each experimental factor are grouped below according to the outcome-related research question to which they contributed an answer. The results also appear in Table 4.1.[11]

**Table 4.1**
**Effects of Experimental Factors**
**on Targeting Decision Outputs (ANOVA of Experiment 1)**

| | Results for ATTACK # | | | *Results for INTENSITY ##* | | |
|---|---|---|---|---|---|---|
| Factor (Levels) | Means | *F* | *p* | Means | *F* | *p* |
| FRAME (Losing / Winning) | --- | 1.086 | .150 | --- | 1.336 | .125 |
| TARGET * (Low / High Value) | .563 / .704 | 4.055 | .023 | .98 / 3.48 | 4.926 | .014 |
| HARM ** (Low / High Nbr) | .724 / .544 | 6.677 | .006 | 3.96 / 0.49 | 9.486 | .001 |
| TARGET x HARM | --- | .548 | .460 | --- | .151 | .698 |

* *p* < .05  ** *p* < .01
\# Where ATTACK is dichotomous with *0 = Do Not Attack* and *1 = Attack*
\## Where INTENSITY is scaled from -100 (Definitely Do Not Attack) to +100 (Definitely Attack)

*Does Support for Attacking the Target Vary with the Benefit Gained?*

Results from analyzing the bi-level ATTACK and scaled INTENSITY dependent variables provided favorable evidence for $H_1$: support for the attack was more likely with the high-value target than with the low-value alternative. An ANOVA of ATTACK by all three factors resulted in a significant main effect of TARGET ($F(1,179) = 4.06$, $p < .05$), with the high-value target resulting in 70% of the group supporting the airstrike,

[11] Logistic regression results for ATTACK appear in Appendix B as an alternative presentation to the ANOVA table.

while only 54% of the participants receiving the low-value target chose to support the attack.. An ANOVA of INTENSITY by all three factors similarly showed TARGET to have a main effect ($F(1,179) = 4.93$, $p < .05$). On average, the high-value target elicited moderate support for the attack from participants, with participants expressing, on average, 3.48 points of support for that target, but a weaker response of only .98 support points for the low-value target.[12] These results all answered the research question in the same way: targets matter in targeting decisions and the more benefit to be gained from a target, the more support.

*Does Support for Attacking the Target Vary with an Absence of Likely Harm?*

$H_2$ also received support from analysis of ATTACK and INTENSITY. With both measures, participants showed less support for attacking the target when presented with a high estimate of harm than when given a low civilian casualty estimate. An ANOVA of ATTACK by all three factors showed a main effect of HARM ($F(1,179) = 6.68$, $p < .01$). Only 54% of participants with high casualty projections supported the proposed airstrike, as opposed to 72% of those presented with the lower estimate of civilian casualties. This outcome was reinforced by an ANOVA of CERTAINY by all three factors. The result was another main effect of HARM: participants who received the low estimate of civilian harm reported an average of 3.96 points of support on a 10-point scale, while those in the high-harm condition averaged only 0.49 points ($F(1,179) =$

[12] Scale was -10 to +10.

9.49, $p < .005$). Civilian casualties clearly matter and higher levels of harm estimates will result in lower amounts of support for attacking the target under consideration.

*Does Attention to Likely Harm Vary with the Target's Benefit?*

No support was available for $H_4$ from ANOVA analyses of ATTACK and INTENSITY. It had been expected that participants with a high-value target would pay less attention to the cost of civilian casualties than those with the low-value target. In both analyses, the interaction of TARGET and HARM was not statistically significant.

*Does a Winning or Losing Frame Affect Support for the Attack?*

$H_3$ had predicted that participants would show more support for attacking when they were in a frame of loss than when in a frame of gain. However, the exploration of ATTACK and INTENSITY found no distinguishable effect of FRAME on support for the proposed strike.

*Does a Winning or Losing Frame Affect Support in High Stakes Dilemmas?*

While prospect frame had no general effect, it was a significant influence in the two experimental conditions that presented high stakes to the participants. As $H_5$ expected, when participants were presented with the opportunity to target two enemy senior leaders, but only at the likely cost of 30 civilian lives, 75% of the participants placed in the domain of loss chose to support the attack. However, as predicted by prospect theory and the targeting decision model, the level of support dropped significantly among individuals facing the same dilemma between security and harm when, instead, they were in the domain of gain. Only 54% of the participants who have been told that their forces were winning supported the proposed airstrike under the same target and casualty conditions ($F(2,53) = 27.91$, $p < .001$). These results were obtained using a reduced data set that included only those participants who were assigned to Conditions 1 or 5, the only conditions where both target value and the civilian casualty estimate were high. An ANCOVA of ATTACK by FRAME with CCP-0 as a covariate was then performed on this revised data.[13] The inclusion of the covariate was necessary to incorporate into the analysis the dissimilar values of $I_0$ that existed in the two conditions.

When INTENSITY was used to check for this same high-stakes effect of FRAME, the effect was found to be similar, but only on the cusp of statistical significance ($F(2,53) = 5.89$, $p = .053$).[14] The mean score in the negative frame was 4.02, while among those in the positive frame the average score was 0.02, offering further confirmation of the influence of framing on decisions under these specific conditions.

## Decision Process Analyses

Analyses of the CCP_REPORT variable were supportive of the process predicted by the targeting decision model and provided insight into the evolution of the choices captured at the end of the scenario by the ATTACK and INTENSITY measures. The 14

[13] CCP-0 was also significant ($F(1.53) = 4.31$, $p < .05$). Model was evaluated while holding CCP-0 = 43.71.
[14] CCP-0 was also significant ($F(1.53) = 6.35$, $p < .01$). Model was evaluated while holding CCP-0 = 43.71.

measures of CCP-0 through CCP-13 documented the participant positions with regard to the proposed air strike after each information item. Selected points were analyzed in two ways. First, the average CCP_REPORT values that were measured immediately before and after the introduction of each of the three experimental manipulations were plotted. These points were then compared to the theoretical expectation at that stage of the experiment. This approach took advantage of the process tracing aspect of these in-progress CCP measures to visually display the changes in the participants' evolving choice as first prospect frame, then target value, and finally the civilian casualty estimate were introduced. Overall, the expected and actual CCP patterns were very similar.

Second, these same values of CCP-REPORT were made the subject of between-group and repeated-measure ANOVAs using the factors that had been introduced up to the corresponding point in the scenario. These analyses give both a qualitative and quantitative picture of how the decision process develops, marking and dissecting the changes in CCP level, as well as progress toward the final decision. The results will show that prospect frame, though absent in the results from the analysis of ATTACK and INTENSITY, was an active influence during portions of the decision process. In addition, the target value, and civilian casualty manipulations both worked as theoretically expected in the choice process. Finally, a special case that led to a result that was opposite to that predicted by prospect theory and the targeting decision model will be discussed.

*Plotting CCP Traces*

Based on the process view of the decision model described in Chapter III, expected traces of CCP_REPORT were built from the following theoretical expectations for CCP movement due to the introduction of the three experimental manipulations. Supporting information about the target was provided in Information Items 3-7 and about the estimate of civilian harm in Information Items 8-13, but were not plotted. These items were drawn from targeting decision model's outcome view and were the same for every participant. The additional information included inputs such as the high probability of successfully hitting the target, the high reliability of the casualty estimate, and an affirmation of the legality of the airstrike in light of both the target and casualty estimate. As expected, most of the CCP movement occurred during the introduction of the three manipulations and not during the additional information. The expected CCP movement was as follows:

- Information Item 0 to 1 (FRAME)
  - Losing Frame: CCP up sharply (risk-seeking in domain of loss)
  - Winning Frame: CCP down moderately (risk-averting in domain of gain)
- Information Item 1 to 2 (TARGET)
  - Low-Value Target: CCP down moderately (doubtful of target importance)
  - High-Value Target: CCP up sharply (certain of target importance)
- Information Item 7 to 8 (HARM)
  - Low Civilian Casualty Estimate: CCP down moderately (moderate desire to avoid harming a few civilians)
  - High Civilian Casualty Estimate: CCP down sharply (strong desire to avoid harming a large number of civilians)

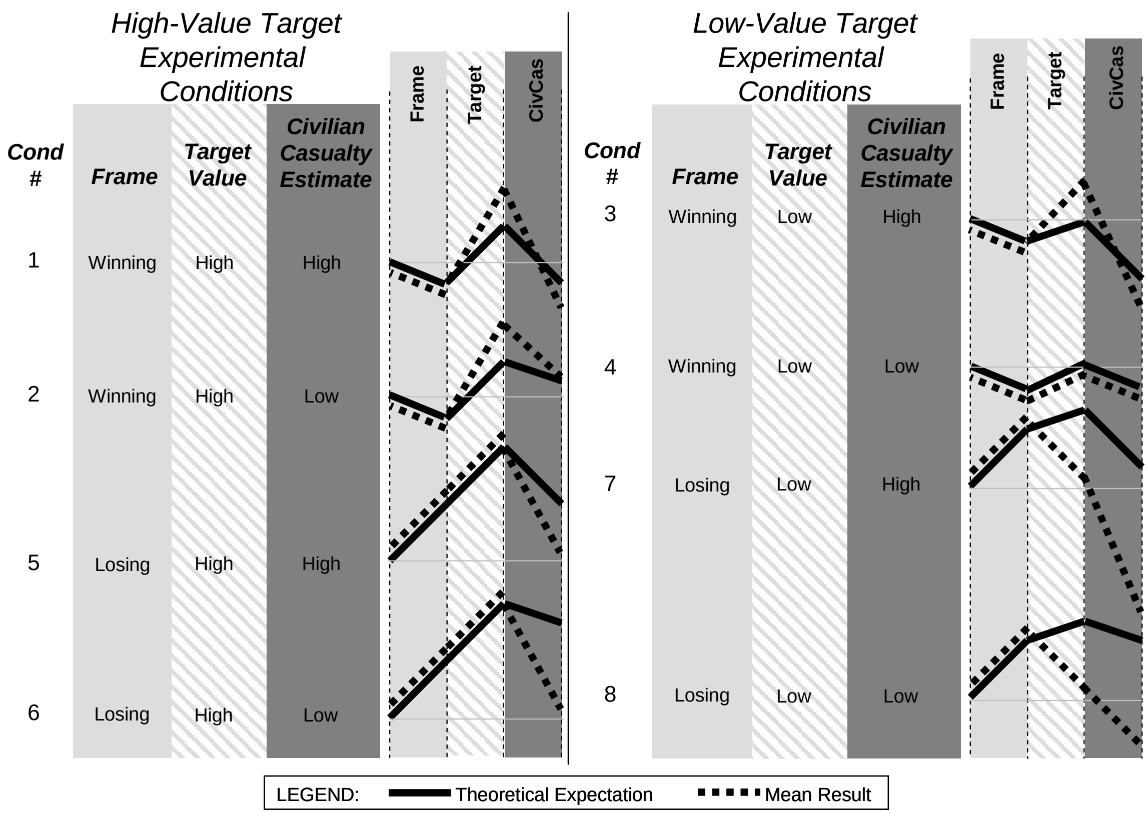
These theoretical CCP traces were paired with the mean values of CCP_REPORT for each of the eight conditions in Figure 4.5.[15] The results were good qualitative matches in six conditions, with the expected and actual traces matching in direction for every factor, although the CCP-REPORT was sometimes more extreme in its movement than expected. The remaining two conditions contained the winning frame and the low-value target. There, the expected and actual traces matched direction in response to both the frame and civilian casualty manipulations, but CCP-RECORD moved opposite to the prediction in response to the low-value target input. The rationale for this apparent anomaly is offered later in this section.

*Information Item 0: Starting Point*

The average participant started at the moderately supportive choice propensity of 38.63 on a scale of -100 to 100. Given that the participants were military members, this initial bias toward support was not unexpected (see Semmel and Minix 1979). As explained in Chapter III, cognitive calculus labels this starting point $I_0$. The broad range (-100 to +100) of the initial values of $I_0$ served to raise the bar for a successful test of the process view of the targeting decision model using this data.

[15] In the figure, all plots begin at the same relative point, so can be compared across conditions. However, the horizontal axis in each plot is for reference only and does not denote the boundary between positive and negative valence (i.e., an *attack* or do-*not-attack* decision).

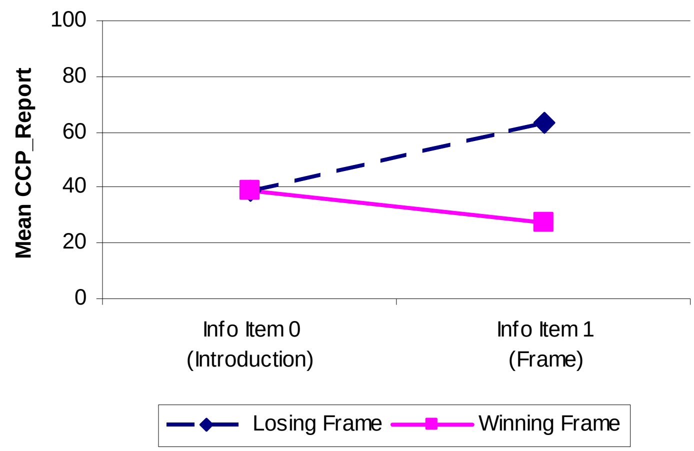
**Figure 4.5**
**Actual and Expected CCP Movement Due to Manipulations**




*Information Item 1: Introduction of FRAME*

Whereas FRAME had no main effect on either of the two decision outcome measures, a clear influence was apparent in the CCP self-reports at the point where the frame manipulation was introduced. Participants who had been assigned to the losing condition responded, on average, with a support rating of 63.50, according to an ANOVA of CCP-1 by FRAME ($F(2,185) = 68.40$, $p < .001$). Those in the winning condition recorded a much lower average score of 27.07. The CCP movement that resulted is shown in Figure 4.6. As expected, the participants in the domain of gain were risk averse and less supportive of the attack in the face of likely civilian casualties. Also, the participants in the domain of loss were risk prone and more supportive of the airstrike.

**Figure 4.6**
**Effects of FRAME on CCP**
**Across Information Items 0 & 1**

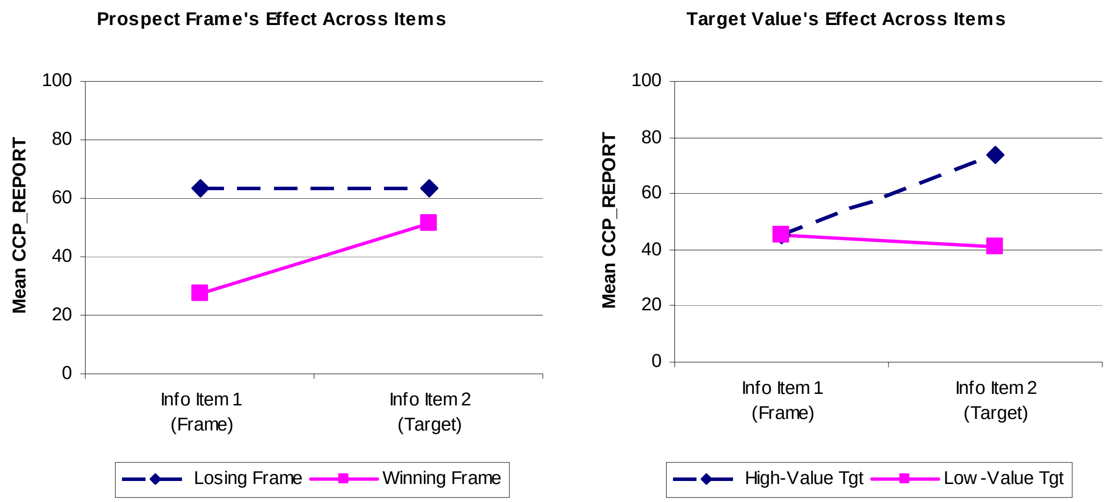



*Information Item 2: Introduction of TARGET*

The introduction of different levels of TARGET had a substantial effect on participant responses in the predicted direction. Participants who were in the low-value target condition reported a support score of 41.05 on average, while the mean score entered by those who received the high-value target was 73.76, as shown by an ANOVA of CCP-2 by FRAME and TARGET ($F(1,183) = 18.61$, $p < .001$). However, FRAME's main effect from the previous information item was no longer significant in these between-group ANOVA results. An ANOVA of CCP-1 and CCP-2 (before and after the introduction of TARGET) as a repeated measure with FRAME as a factor revealed why this was so.

The repeated-measure analysis pointed to an interaction between the repeated measure and FRAME ($F(1,183)=7.85$, $p < .01$). As shown in the first panel of Figure 4.7, the introduction of the TARGET manipulation at Information Item 2 resulted in no significant change in the average CCP score given by participants in the losing frame. The average participant in this group, already acting as a risk seeker and strongly supportive of the airstrike, did not find reason in the new target information to change that position. However, those in the winning frame were quick to abandon their initial position of relative risk aversion when presented with the target information. These participants significantly raised their CCP scores, independent of the value of the target in their scenario. Because the mean CCPs of the two frame groupings ended up relatively close together, FRAME lost its influence as a main effect. This converging tendency stood in stark contrast to the divergence apparent in the effect of the variation in target value on mean CCP scores, as shown in the second panel of Figure 4.7. That panel visually depicts the power of the different targets to drive participant support, with the high-value target securing a mean support score that was more than 30 points higher than the average response of participants with the low-value target.

**Figure 4.7**
**Effects of FRAME and TARGET on CCP**
**Across Information Items 1 & 2**

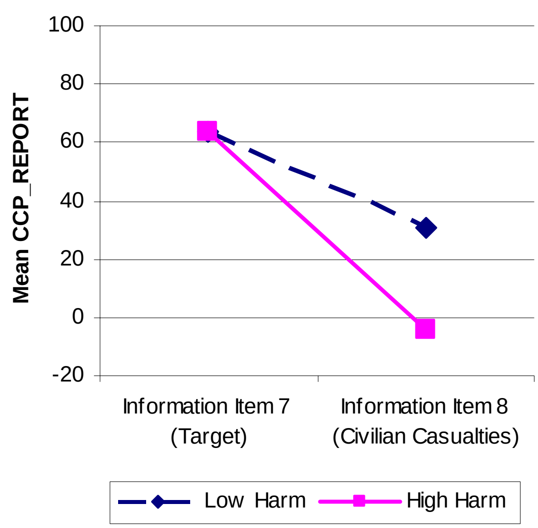



*Information Item 8: Introduction of HARM*

The most dramatic changes in CCP levels occurred at this point in the scenario as participants were informed of the number of civilians likely to be harmed by the proposed airstrike in their scenario. All three experimental factors influenced values of CCP_REPORT at this point in the experiment. Looking first at the effect of HARM, an ANOVA using CCP-7 and CCP-8 (before and after introduction of HARM) as a repeated measure highlighted a substantial influence from the manipulation of estimated humanitarian harm. As shown in Figure 4.8, introduction of the civilian harm information dropped the average CCP scores from the Item 7 mean of 63.87 to 30.89 in the low-casualty condition and to -4.36 in the high-casualty group ($F(1,179) = 22.41$, p <

.001). This result was in the direction expected, with those in the high-estimate conditions being more reluctant to support the airstrike. In fact, the average CCPs reported in each of the eight conditions all dropped to near or below the mean starting point of 38.63 recorded at Information Item 0. While the model predicted this drop, the magnitude of the changes in mean CCP was approximated four to six times larger than any decrease caused by either FRAME or TARGET. In addition, the high civilian casualty estimate resulted in the first negative mean CCP score, indicating disapproval of the proposed attack.

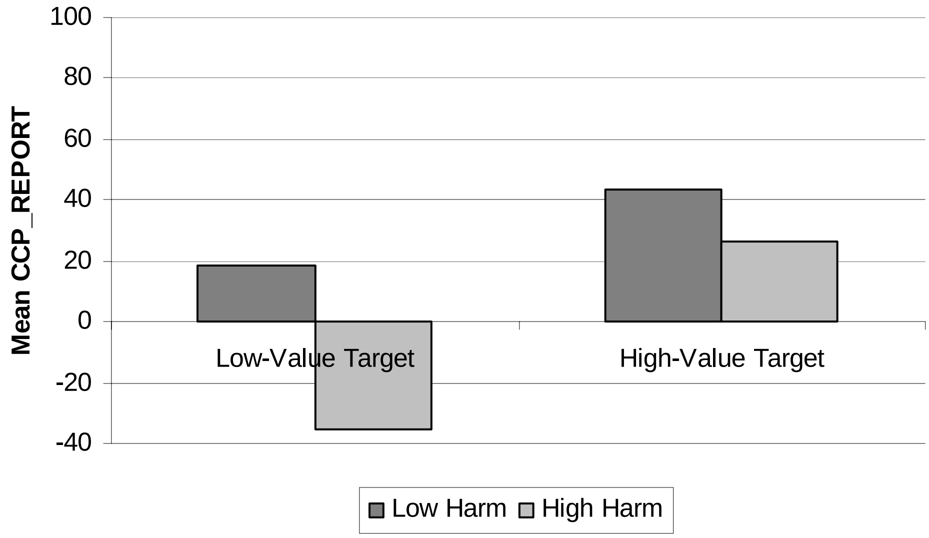
**Figure 4.8**
**Effect of HARM on CCP**
**Across Information Items 7 & 8**




Moving to the second factor, the main effect of TARGET continued to exert a strong influence in the expected direction in CCP-8, with the high-value target conditions reporting an average CCP score of 34.87 and the low-value conditions recording a much lower -8.35 ($F(1,179)=18.06$, $p < .001$). Despite the fact that the participants were newly aware that approving the airstrike would mean that civilians would likely die, the participants with the high-value target were still quite willing to press on with the attack. However, those with the low-value target often found the cost too great for the level of benefit available, as indicated by the negative valence of their average score.

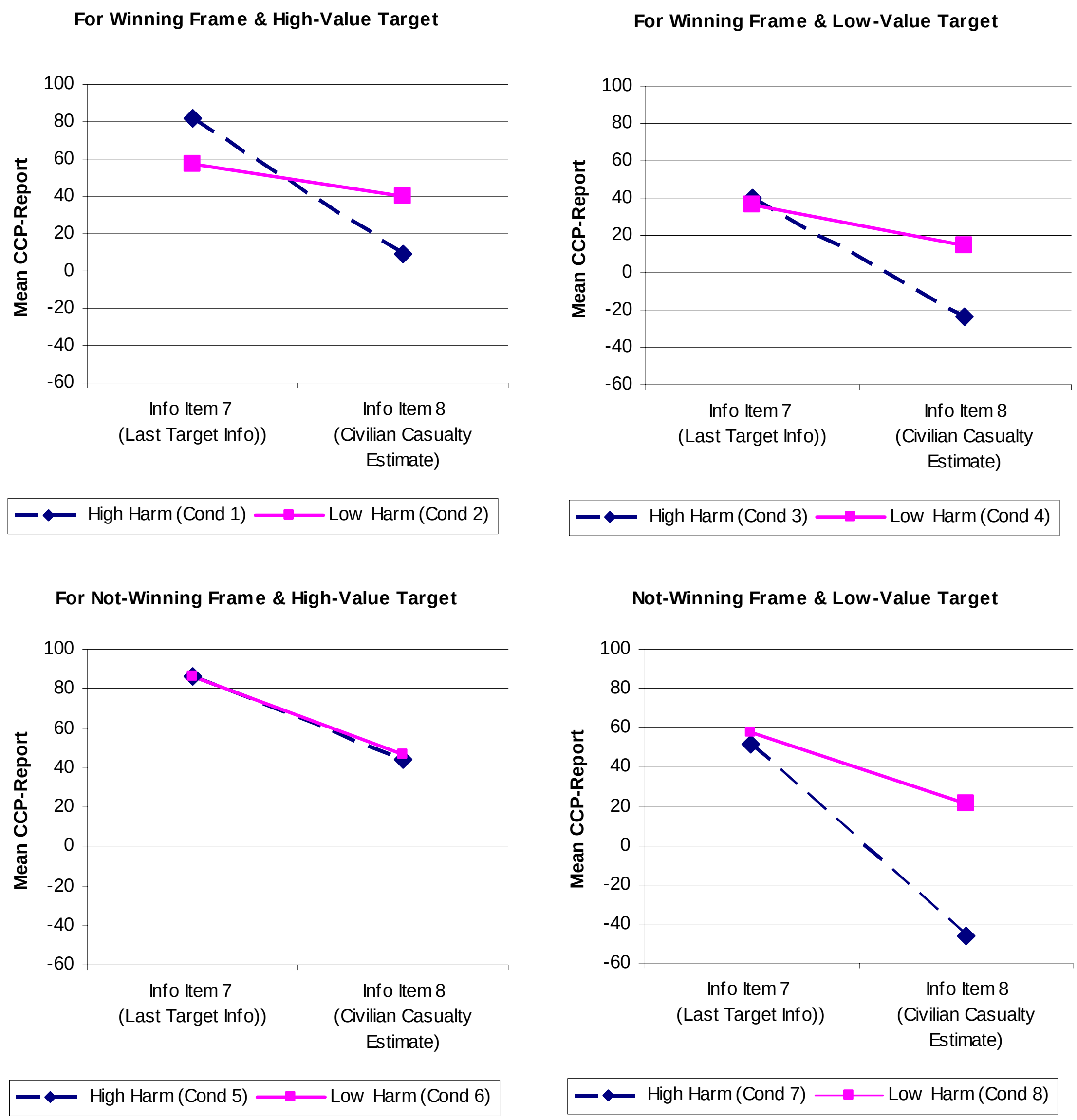
Additionally, as predicted in $H_3$ and shown in Figure 4.9, target value moderated the effect of the civilian casualty estimate as it was introduced ($F(1,179)=3.27$, $p < .05$). This interaction of the two factors caused the participants with the low-value target to be much more sensitive to the cost of civilian casualties than were those who had received the high-value target. In the low-value target conditions, there was approximately a 20-point drop in mean CCP scores when moving from the group in the low harm group to the group facing the high estimate of harm. However, this sensitivity was magnified among participants who received the low-value target description. In the high-harm, low-value condition, the average support was over 50 points below the average in the low-harm, low-value situation—while also switching the valence of the average CCP score from positive to negative. This phenomenon was consistent with a distinctly stronger aversion to risking larger numbers of civilian lives for a target that offered little expected contribution toward defeating the adversary.

**Figure 4.9**
**Influence of Interaction of TARGET and HARM on CCP**




While FRAME exhibited no main effect at this point in the scenario, it was not without influence. A significant interaction occurred between the repeated measure built with CCP7 and CCP8 and all three of the experimental factors ($F(1,179)=4.22$, $p < .05$), providing additional insights into the inner workings of CCP score movement as the variations of HARM were introduced. This interaction has been broken down into the four panels shown in Figure 4.10, each corresponding to a particular combination of prospect frame and target value. The top two panels both correspond to winning frame conditions and show a pattern of movement that is very similar to the overall pattern depicted in Figure 4.8. In that figure, the low-harm input resulted in a drop of 20-30 points between measurements and the high-harm input approximately doubled that for a 60-point drop.

**Figure 4.10**
**Effect of FRAME, TARGET, and HARM on CCP**
**Across Information Items 7 & 8**




When comparing the two left panels in Figure 4.10, one can see the sensitizing effect of the winning frame on cost in the presence of a high-value target. Furthermore, when comparing the bottom two panels, the effect of shifting the target value from high to low while maintaining the losing frame also becomes clear. While the participant support responses in the lower left panel did not show differentiation between the two levels of humanitarian harm, the lower right panel shows the most distinguishing responses among the four panels. In this losing, low-value-target condition, participants expressed, on average, a 101-point drop in support for the proposed attack when it was accompanied by the likelihood of harming 30 civilians. This response would be consistent with participants who had become strongly persuaded that the attack should not proceed against a "fool's bet" target that contributed little to the fight, yet was likely to exact a great humanitarian cost. This cost was evidently amplified by the losing frame and the low-value target, both factors that had induced risk aversion and drops in CCP_REPORT on their own.. The rationale behind this additive effect may have been that participants incorporated additional political and social costs due to the local and international backlash that would be reasonably expected if the cost of the attack was seen as severely disproportional to the benefit gained. This backlash would be all the more costly when the friendly forces were already losing the conflict and badly needed the good will of the local populace and of their allied nations. For the remainder of this dissertation, the condition corresponding to the losing frame , low-value target, and high estimate of harm (Condition 7) will be referred to as the Fool's Bet condition.

Finally, when looking at the right two panels in Figure 4.10, it is clear that it is no longer the winning frame that is sensitizing participants to cost. As just recently described, in the left two panels it was the winning frame that made participants more sensitive to civilian casualties when juxtaposed against a high-value target. This result was consistent with prospect theory. However, in the two right panels, both of which are associated with the low-value target, it was the *losing* frame that made participants react most distinctly to the differences in estimates of likely harm. This result is a variance from prospect theory's expectation for how framing works, yet it makes sense in the context of the Fool's Bet. In Condition 7, the standalone abilities of the losing frame and the low-value target to induce risk aversion were combined to further amplify the already high cost of the civilian casualties.

*Summary of In-Process Effects*

The above analyses of the in-progress measures of participant support revealed a rich landscape of causal relationships with the three experimental factors, both alone and in combination with each other. This provided four points of useful feedback for the model, with each point corresponding to one of the first four hypotheses.

First, the benefit of a given target ($H_1$) exerted a strong influence in the model which was capable of both increasing and decreasing support. The target with higher perceived benefit generated uniformly strong support for attacking. However, the low-value target, under certain conditions, caused participant support to drop. These influences of variations in TARGET lasted through the remainder of the scenario.

Second, humanitarian cost ($H_2$) also mattered in the determination of participant support for the airstrike, leading to some dramatic decreases in CCP scores and causing a significant number of participants to switch from supporting to not supporting the attack at that point in the scenario. The estimate of civilian casualties prompted a very strong response from participants upon its introduction, rapidly decreasing support for low estimates of harm, but caused support to plummet when casualty expectations were high. In this latter case, the CCP-8 mean carried a negative valence, indicating that the group of participants in the high-harm conditions were ready to reject the attack. These effects of HARM continued until the end of the scenario.

Third, this effect of the civilian casualty estimate was made more nuanced by the target value given to the participant ($H_4$). When the target value was high, differences in the size of the civilian casualty estimate mattered relatively little compared to when the target value was low. When participants knew that the air strike would only gain the benefit of killing two insurgent operatives, they gave the humanitarian harm information more weight in their decision process and their CCP responses were accordingly more distinct.

Fourth, the analyses prompted additional insights into how framing ($H_3$) operates in these targeting decisions. Except for when FRAME was first introduced, it exerted no main effects, but did significantly influence how other factors affected CCP_REPORT. However, these effects came and went as prospect framing showed itself to be a very conditional source of influence. At the outset of the experiment, losing improved support for an attack and winning lowered support. This outcome agreed with the model. However, this straightforward result occurred only when no specific information about target benefit or civilian casualty cost was available to the participants. In particular, the effect of the winning frame was weak and the clear differentiation between prospect frames in the results disappeared as soon as specific target benefit information was introduced in the next information item.

Yet, framing modified the effect of benefit and cost later in the scenario. This modification took two different forms, depending on the value of the target. When attacking the target was expected to bring a high payoff, it was frame that determined whether participants were risk accepting or averse, with the losing frame leading to acceptance and the winning frame resulting in aversion, as theoretically expected. However, when the target offered little benefit, an inversion occurred, leading the participants in the losing frame to become even more risk averse than individuals in the winning frame. This was the opposite of what prospect theory would have predicted. Individuals who are in the domain of loss are supposed to take risky chances in order to improve how their position. Translated into the targeting model, this meant that the participants who were losing (but wanted to win) were expected to be more willing to attack the target, despite the risk of harm to civilians. However, participants with the low-value target and high civilian casualty estimate were faced with overwhelming cost for very little, if any, gain—what was labeled earlier as a Fool's Bet—and their CCP scores dropped significantly. This result offered a modification to the model that will be tested in Experiment 2.

Furthermore, it can now be seen that the unexpected direction of the interaction of FRAME and TARGET in the manipulation check that explored participants' perceptions of cost was a component of the Fool's Bet phenomenon. Figure 4.4 had previously shown how the combination of a losing frame and a low-value target had raised participant sensitivity to the cost of casualties. This was not a problem with the FRAME manipulation, but one piece of what has since been labeled the Fool's Bet condition. Similarly, the actual CCP traces from the two conditions with winning frame and low-value targets (Conditions 7 and 8) differed from theoretical expectations because of this same phenomenon. While the low-value target had been expected to moderately elevate the participants' CCPs, in the presence of the losing frame it led to a drop in CCP instead. Both of these results were thought to be aberrations at the time, but were actually different partial views of the Fool's Bet condition.

However, the influence of prospect frame was also often weak. Whether this was inherent in the factor itself or due to an insufficiently powerful manipulation in the experiment is not known for certain. However, as described earlier, the post-scenario questions did point to the participants' recall of the frame manipulation being the poorest of the three experimental factors. A review of the results from asking participants how American forces were faring according to the scenario showed that over 70% of the incorrect answers were from participants in the losing frame. Furthermore, all of their answers except for one were "Unknown" or "Stalemate."

The sometime problematic performance of FRAME may have been attributable to its placement in the scenario. As the first manipulation of the three experimental factors, and followed by 12 additional items of information prior to each participant's final decision, its influence may have been overwhelmed by other considerations. This explanation is strongly supported by the fact that participants responded so clearly and in the anticipated manner when FRAME was introduced at Information item 1, yet the main effect of framing was immediately eclipsed in the next item's TARGET manipulation. These two experiments may offer unique insights into the experimental exploration of multiple aspects of choice behavior in a context varied through the use of framing.

In a brief survey of other political science experiments that have investigated the effects of prospect frames, these investigations have routinely tested only hypotheses directly related to framing. They also have consisted of a single scenario input requiring only several lines of text, followed immediately by the presentation of decision options or a series of questions (Boettcher and Cobb 2006; Boettcher 2004; Quattrone and Tversky 1988). The targeting decision scenario differed from this pattern, not only in its simultaneous investigation of the roles of benefit, cost, and framing, but in the amount and variety of information provided to the participants. Because of the fixed flow of information received by the participants, they were presented with significantly more and more varied information than appears to have been the norm in related experimental investigations. Although targeting decision makers during an actual conflict would be dealing with even larger amounts of more complex information, they would also be immersed in the current prospects for their side's success and unable to easily let it slip out of focus. Improvements in the strength of presentation of framing inputs in experimental scenarios would be required to more closely mimic the power of real-world framing.

Another explanation may have also contributed. Participants' perceptions of what constitutes "winning" and "losing" may have confounded the FRAME manipulation in a limited, but substantive number of cases. Given the seniority of the participants, they may have overlaid their own experience or pragmatism on the scenario and been unwilling to accept the provided progress assessment (i.e., the framing) as ground truth. This may have led these participants to respond from a position other than the domain of loss intended by the experimental condition. This issue could have resulted from contravening participant experience, bias, or other internal factor.

While the results of this test of framing are mixed, it is also important to recognize that the concept of framing is itself somewhat ambiguous. Tversky and Kahneman (1981, 453) defined *decision frame* to mean "the decision-maker's conception of the acts, outcomes and contingencies associated with a particular choice" and tied it to deviations from a reference point. This leaves much leeway in defining a frame and how it works. It also explains in part why neither psychologists nor political scientists have yet developed a theory of framing (Boettcher 2004). Outcome framing, the type used in this experiment looks at changes with respect to a reference point that is anchored on the status quo. However, framing effects can also be based on perceived differences from a goal, or what Heath, Larrick, and Wu (1999) called an "aspiration level." The actual source of framing in operation may also vary from person to person. Tversky and Kahneman (1981, 453) expected the perception of frame to be individualistic, depending on "the norms, habits and personal characteristics of the decision maker." While framing effects induced through experimental manipulations, such as was done here, are considered to be somewhat reliable (see Boettcher 2004), additional research is required to better understand the framing phenomenon.

In this experiment, it was apparent from the results that prospect frame exerted influence in multiple ways, but never as clearly as expected. The effects of FRAME will be discussed further in the next chapter. Also, the concluding chapter will explore how the presentation of FRAME can be improved in future investigations so as to minimize these likely detractors.

## SUMMARY

This chapter described the construct and the results of the first of two experiments. Intentionally constrained to present all the available information in a fixed order to all of the participants, this experiment afforded the opportunity to study both their final decisions, as well as how the information affected the formation of those choices as each new piece of information was introduced. All three experimental factors played roles in outcome and process. Individual CCPs were tracked throughout the scenario and the historical plots of their traces provided multiple interesting insights into how choice develops and changes en route to targeting decisions. Additionally, high stake and Fool's Bet conditions were identified as unique and important within the targeting decision model. In these special cases, in particular, prospect frame mattered.

The following chapter will focus on the second experiment, which lifted some of the constraints on information flow and decision timing in order to enable the investigation of different aspects of the decision process. The effects of TARGET, HARM, and FRAME on decision outcomes were expected to remain the same in this second experiment. However, the more fluid design would prevent most comparisons of

CCP_REPORT as had been done in this first experiment. Instead, new process measures would be used to gather data on information use patterns and decision timing. This permitted analysis of the remaining research questions focused on the relevance of certain types of information and shifts in decision thresholds. In addition, the ability for participants to make early decisions was expected to enable exploration of a more natural information flow that ends as soon as a decision is made and the decision maker stops listening. The first experiment forced participants to read all the information, even if their own CCP had reached a decision threshold prior to the last information item when they could record their choice. How this might affect final decisions is not yet understood.

# CHAPTER V

# EXPERIMENT 2: DESIGN, HYPOTHESES, AND RESULTS

The second experiment was included in this dissertation to build on what was learned in Experiment 1 by enabling the exploration of additional decision process parameters. While the first experiment had provided insight into *what* targeting decision was made under various conditions, it was more limited in what it could say about *how* and *why* those outcomes resulted. This was because the experimental design pushed information to the participants, giving them no opportunity to indicate either what information was meaningful to them or when they had heard enough. Hence, Experiment 2 was specifically designed to explore more of the decision process and to develop answers to the following research questions: *Does the sequence of the inputs matter? When do decision makers use more of one type of information than another? When do decision makers view less than all the information and make an early choice?* These questions are important because they relate directly to the process aspects of the model and its expectations that choices happen whenever an individual's CCP reaches the corresponding decision threshold. Therefore, participants' preferences for the type (valence) of information, the order in which it is accessed, and the position of the participants' decision thresholds hold the keys to understanding better what decision will result and how quickly it will be made.

In order to study these additional aspects of the targeting decision process, alterations were made in the first experiment's design to permit variation in the flow of information and in decision timing. Also, five new processing parameters were added to capture variations in how participants accessed information and moved through the scenario. The results of the experiment both corroborated the decision outcome results from Experiment 1 and offered conditional answers to queries into how these decision outcomes were generated.

This chapter will proceed to describe the design, expectations, and results of Experiment 2 in much the same manner as the previous chapter did for the first experiment. Where variables or other aspects of the second experiment are unchanged, they will be only briefly described here, since additional details were provided in the previous chapter.

## DESIGN AND ADMINISTRATION

This section will provide an overview of the unique features of this experiment's design, the variables explored in this experiment, and the expectations that were developed concerning relationships between those variables. It will also explain how tests of these hypotheses were incorporated into the experiment's design. Finally, the section will describe the participants and experiment administration.

### Unique Design Features

While this experiment used the same scenario as the first, participants were afforded more control over what information they viewed and when they could make their final decision. Experiment 1 had used a fixed flow of information, requiring that all participants review all 13 information items and then enter their choice about supporting or rejecting the proposed airstrike. However, in Experiment 2, participants could view as few as 7 information items or as many as all 13 before entering their decision. They could also move freely between the target and civilian casualty information categories, based on whichever was more salient to them at that time, as they sought input before making their choice.

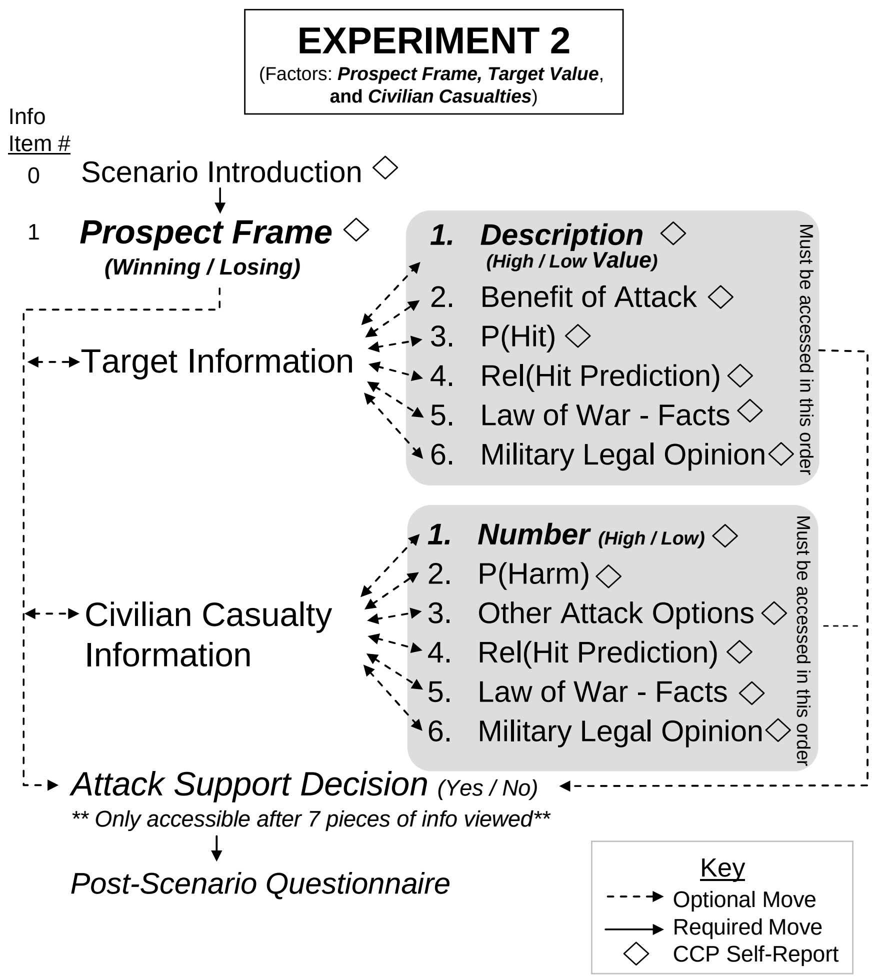
Figure 5.1 depicts the revised experimental design and the differences in how participants could move through the scenario. Beginning with Information Item 2, participants were free to view the first item in either category and remain in the category until the six items were exhausted, or they could move back and forth between the categories at will.[16] This design feature allowed participants to focus mainly on information about the target or on the estimate of civilian casualties, as they desired.

However, complete freedom for participants in information access selection and decision timing was not provided. This constraint was put in place in order to preserve the experiment's ability to generate results based on all three experimental factors. All participants were required, at a minimum, to view the first information item from both categories since this item was where the TARGET and HARM experimental treatments were located. Only then would participants know both the description of their assigned target and the associated estimate of likely harm. This prerequisite determined the minimum amount of information required prior to an early decision. Because participants could view all six of the information items from one category before

[16] The ordering of information within each category was predetermined. Participants could only select a type of information. They would then be provided the next item in that category's queue.

viewing the first item from the second category, the scenario was programmed to only permit early decisions after the seventh and subsequent information items.

**Figure 5.1**
**Flow of Second Experiment (Variable Information)**




## Variables

Several variables were carried forward from the first experiment: the factors TARGET, HARM, and FRAME; the outcome dependent variables ATTACK and

INTENSITY; and the process parameter CCP_REPORT. However, CCP_REPORT could be used for comparison across conditions and participants only at CCP-0 and CCP-1 (the measurements corresponding to Information Items 0 and 1).[17]

Because this part of the project was intended to focus on the patterns of information access and decision timing, five new process measures were also included. The total number of information items viewed, TOTAL_ITEMS, was used to gauge the size of participants' need for information before making a final decision.[18] TOTAL_ITEMS was a count variable ranging from 7 to 12 because it started tracking the number of information items accessed when participants were first able to make a final decision. FIRST_ITEM captured the category from which participants selected their first piece of optional information.

The way that participants then moved between the target and civilian casualty information categories was also expected to be pertinent. This aspect was characterized by DIVERT_ITEM, a measure of when participants switched from their initial information category to the next. DIVERT_ITEM was a discrete variable that ranged from 2 to 7, reflecting the reality that participants' first opportunity to switch was upon selecting their second optional information item and their last opportunity would be following their sixth item, if they had elected to exhaust one category's information first. TARGET_ITEMS and HARM_ITEMS tracked the number of information items viewed

[17] After Information Item 1, there was no fixed order of information access across all participants. This prevented the comparison of CCPs across all participants and conditions, as had been done in Experiment 1 with a fixed sequence of information.

[18] Initially, the number of items viewed from each of the target and civilian casualty estimates were also tracked, but are not reported here. For the conditions of interest in the related hypothesis, these individual category counts provided no additional information beyond that available in the results of the analysis of TOTAL_ITEMS.

in each of the individual categories. Finally, how participants used time during the choice process remained an interest item from Experiment 1. Time was incorporated into Experiment 2 through the use of TOTAL_TIME as a measure of time from Information Item 1 to the final decision.

**Hypotheses**

All five of the hypotheses from the first experiment were tested again. They are repeated here for ease of reference:

- $H_1$ (Support Varies with Target Value) – Participants will show more support for attacking the high-value target than the low-value target.
- $H_2$ (Support Varies with Absence of Harm) – Participants will show less support for attacking the target when presented with the high civilian casualty estimate than the low estimate.
- $H_3$ (Support Varies with Prospect Frame) – Participants will show more support for attacking the target when they are in the losing frame than in the winning frame.
- $H_4$ (Sensitivity to Harm Varies with Target Value) – Participants with a low-value target will be more sensitive to differences in civilian casualty estimates than those with a high-value target.
- $H_5$ (Influence of Framing on High Stakes Conditions) – If participants are confronted with the high target value and high civilian casualty estimate, they will be more likely to support the attack if they are in the losing frame rather than the winning frame.

A sixth hypothesis was added to test the resiliency of the Fool's Bet phenomenon found in the first experiment, which operated as explained below:

- $H_6$ (Framing's Influence on Fool's Bet Conditions) – When placed in a situation with a low-value target, but a high estimate of civilian casualties, participants in the losing frame will show less support than those in the winning frame.

Additional hypotheses were constructed for the new process measures enabled by the new experimental design. Once participants were given control over information selection, FIRST_ITEM was the initial indicator of which category of information was most relevant to them. A second indicator of relevancy was DIVERT_ITEM, or how long they continued to view items from that initial category. Participants in the losing frame were expected to more frequently choose the target category and continue viewing information from that category longer than those in the winning frame. This would be the case because participants in the domain of loss would be more accepting of risk and benefit-related information would be more relevant than the costs entailed in the civilian casualty information.

- $H_7$ (First Type of Information Accessed) – Participants in the losing frame will be more likely to view target information first and longer than those who are in the winning frame.

A third contribution to an understanding of relevancy was the individual counts of total information items accessed in each of the two categories. TARGET_ITEMS was expected to be higher than HARM_ITEMS when participants were in the losing frame and benefit-related information was particularly relevant. On the other hand, this relationship would be reversed, with HARM_ITEMS posting the higher count of the two categories when participants were in the winning frame. This would make them risk averse and raise the relevancy of information associated with potential costs.

- $H_8$ (Information Use by Category) – Participants will view more target-related information items when participants are in losing frame than in the winning frame. They will view more harm-related items when they are in the winning frame than in the losing frame.

Participants were assumed to use information as a whole to assess and process risk, so total information use was expected to be related to risk attitude. Harm-related information would answer questions such as “How bad will this get?” Target-related items might be accessed to answer queries similar to “Is this cost really worth it?” Therefore, information need was anticipated to climb when risk was high and participants were risk averse. Being in the domain of loss, they would act conservatively and exercise extra care in their decision process. On the other hand, requirements for information would dip, despite the high level of risk, whenever individuals were risk accepting. Positioned in the domain of loss, these participants would be ready to gamble and so would be less intentional in their choice formation. Since risk was anticipated to be greatest in the high-stakes conditions, the hypothesis below is focused on responses when both TARGET and HARM were at the high level.

- $H_9$ (Total Information Use Under High Stakes Conditions) – When target value and estimate of harm are both high, participants in the winning frame will access more information items overall than those in the losing frame.

Additionally, the targeting decision model predicted that the total amount of time from the start to the finish will be determined by the position of the associated threshold, given a particular set of information. Thus, a faster *attack* decision will result whenever a participant's $TH_{Attack}$ is shifted lower by the losing frame and his or her CCP can reach this threshold sooner. The opposite will occur in the winning frame, when $TH_{Attack}$ has been moved farther away and the decision therefore will be more delayed. Since this effect of framing is dependent on the valence and relevancy of the information viewed, this hypothesis will be tested using the high-stakes conditions. While all participants in these conditions did not view the exact same information, they will have all seen the same values of TARGET and HARM, the inputs expected to have the most impact. Furthermore, the high-stakes conditions posed a difficult dilemma that could be expected to take some time to resolve. Therefore, these conditions offered a difficult test for the operation of framing on decision timing.

- $H_{10}$ (Speed of Decision Under High-Stakes Conditions) – Participants in the losing frame will make a quicker decision than those in the winning frame.

**Research Instrument**

As explained and shown earlier in this chapter (see Figure 5.1), Experiment 2 contained all the same information and manipulations of TARGET, HARM, and FRAME. In addition, through the scenario introduction and the first information item, it ran exactly as did Experiment 1. However, beginning with Information Item 2, participants were asked to use a menu to select and view information about the target or the civilian casualty estimate. After each item, they were returned to the menu for the next selection. There were six items of information that were accessible through each of the two menu buttons. The sequence of these six items within each category was fixed.

As before, all participants provided self-reports of their CCP after reading each new piece of information. They also recorded their final decision to either support or not support the proposed airstrike, although that final choice could be made as early as after reading Information Item 8 or as late as following Item 13. The minimum number of eight items was necessary to ensure that all participants received all three experimental treatments. After making a final decision, all participants completed the same post-scenario questionnaire that was used previously. Also, the computer tracked all participant selections and elapsed time.

## Administration

One hundred eighty professional military education students agreed to participate in the experiment as anonymous volunteers. Recruitment and access to the experiment was unchanged from the approach used for Experiment 1. The sample was reduced by one case during the analysis of the time variable in order to remove an extreme outlier.[19]

---

[19] A box and whisker plot identified one extreme outlier that was more than three-times the size of the next closest time entry.

# RESULTS

Despite the participants having greater control over the flow of information and the timing of their final decision, the tests of the five hypotheses repeated from the previous experiment had very similar results to those from Experiment 1. This confirmation of findings under revised conditions increased the robustness of these results. Additionally, the altered design features led to new insights about the decision process, including factors affecting information selection and speed of decision.

These and other results will be described and discussed below. However, first the manipulation checks will be highlighted and an issue with random assignment of participants to conditions will discussed and the remedial actions explained. Following these, the discussion will first focus on the decision outcome analysis and then highlight the decision process results.

## Manipulation Checks

Specific questions answered by each participant following the scenario provided confirmation that the participants understood and responded to the experimental manipulations. Accuracy was at least as high as in the first experiment, with 92% of participants correctly recalling the target value, 96% the number of estimated civilian casualties, and 84% the frame from their assigned scenario.

Additional questions explored how participants perceived benefit and cost. In both cases, experimental factors were found to be influential in the answers provided. An ANOVA by all three factors of the benefit expected from striking the target showed a main effect of TARGET ($F(1.163) = 151.19$, $p < .001$). Participants rated the high-value target as an 8.23 on a 10-point scale while awarding an average of only 4.64 points to the low-value target. When asked to rate the cost of the estimated casualties with respect to the target in their scenario, a similar ANOVA of cost pointed to main effects of HARM ($F(1,163) = 20.23$, $p < .001$) and TARGET ($F(1,163) = 29.01$, $p < .001$).[20] A high estimate of harm led to a mean cost score of 7.09 and the low estimate resulted in only 5.46 points. Showing that cost was relative to benefit, low-value targets led to the higher cost score of 7.26 compared to the high-value target score of 5.30.[21]

These results engendered confidence that the experimental instrument functioned much as it was intended. The results were a positive contribution toward the internal validity of the experiment that is analyzed in the remainder of this chapter.

## Random Assignment Issue

A problem with the random assignment of participants to the eight experimental conditions was identified early in the analysis of CCP_REPORT. A significant portion of the explanatory power of the experimental method is rooted in the use of randomization because the control of variations in the test environment is essential. However, participants routinely bring with them a myriad of different experiences, characteristics, and other internal variations which are beyond the investigator's ability to reliably regulate. When random selection of participants is not possible, as was the

[20] The main effect of TARGET on a cost-related dependent variable suggests an interdependency between benefit and cost.
[21] There was no additional question that specifically checked the framing effect. Nor did frame create a main or interactive effect in the questions about benefit or cost.

case in these experiments, the inevitable differences between participants are routinely handled by randomizing their assignment to the experimental conditions (McDermott 2002). In the first experiment, this assumption was verified by an analysis of CCP-0, the starting point of the decision process. The results showed CCP-0 to be unaffected by any of the three planned manipulations: FRAME, TARGET, and HARM. This indicated that the assignment of participants to conditions had been sufficiently random in Experiment 1.

However, a similar check of the results from Experiment 2 flagged an unexpected issue. The ANOVA of CCP-0 indicated a significant interaction of TARGET and HARM ($F(1,161) = 7.75$, $p < .005$), manipulations that had not yet been introduced into the experiment. Further analysis showed this result was an artifact caused by markedly lower CCP means in two of the conditions (averaging 4.82) than in the remaining six (averaging 36.09).[22] According to the targeting decision model, where a participant's CCP stops is dependent, in part, on where it began. Hence, CCP-0 was pertinent in the analyses of ATTACK and INTENSITY. While the randomization issue could certainly taint the analysis results, incorporation of the starting point into the calculations through one of various methods served to account for these problematic differences between the groups' starting points. Whenever a measure in the following sections was theoretically expected to be affected by a participant's starting CCP, the associated analyses took this into account by including CCP-0 as a covariate or as part of

---

[22] The two conditions with low means were Conditions 3 (Winning / Low Target / Low Harm) and 7 (Losing / Low Target / Low Harm).

a repeated measure. For example, this approach was used in the analysis of both of the outcome variables.

**Decision Outcomes**

Of the three experimental factors, TARGET and HARM were the two that again played significant roles in shaping participants' final decisions. Just as in the first experiment, these decisions were measured in two ways: using the *attack* or *do-not-attack* perspective of the bi-level ATTACK variable, as well as the finer measurement of support for the attack as captured by the scaled INTENSITY variable. The analyses of both measures will be discussed in this section, beginning with ATTACK and using the applicable research questions as a framework. The results also are included in Table 5.1.[23]

*Does Support for Attacking the Target Vary with the Benefit Gained?*

Both ATTACK and INTENSITY reflected stronger support for the airstrike when the target was the two enemy leaders rather than the two insurgent operatives ($H_1$). TARGET exerted substantial influence on the valence of the final decision, as captured by an ANCOVA of the ATTACK variable by all three experimental factors and using CCP-0 as a covariate ($F(1,160) = 31.91$, $p < .001$).[24] The effect was in the direction

---

[23] Logistic regression results for ATTACK appear in Appendix B as an alternative presentation to the ANOVA table.

[24] In this and the other ANCOVAs in this chapter, CCP-0 was also significant and means of the factors were evaluated while holding CCP-0 at its mean of 28.44. The covariate was included because a participant's CCP must travel a greater or smaller distance to cross the decision threshold depending on where the CCP starts. CCP-0 is the measure of $I_0$ in this experiment. Since there was a significantly large

predicted by theory, with the high-value target eliciting support 84% of the time, but with only 48% of the participants receiving the low-value target supporting the proposed airstrike. The main effect of TARGET on INTENSITY was also distinct, as measured by the same ANCOVA approach (F(1,160) = 35.71, p < .001). The low-value target prompted an average support score of -.60, indicating a slight majority were in favor of rejecting the attack, but the high-value target drew much stronger support with a mean score of 5.69.[25]

**Table 5.1**
**Effects of Experimental Factors**
**on Targeting Decision Outputs (ANCOVA of Experiment 2)**

| | Results for ATTACK # | | | *Results for INTENSITY ##* | | |
|---|---|---|---|---|---|---|
| Factor (Levels) | Means | *F* | *p* | Means | *F* | *p* |
| CCP-0 *** | --- | 15.553 | .000 | --- | 17.480 | .000 |
| FRAME (Losing / Winning) | --- | .048 | .414 | --- | .020 | .444 |
| TARGET *** (Low / High Value) | .476 / .835 | 31.908 | .000 | -.559 / 5.691 | 35.712 | .000 |
| HARM ** (Low / High Estimate) | .738 / .572 | 6.776 | .005 | 4.094 / 1.038 | 8.468 | .002 |
| TARGET x HARM | --- | 1.116 | .146 | --- | 1.308 | .128 |

* *p* < .05 ** *p* < .01 *** *p* < .005
# Where ATTACK is dichotomous with *0 = Do Not Attack* and *1 = Attack*
## Where INTENSITY is scaled from -100 (Definitely Do Not Attack) to +100 (Definitely Attack)
Factor effects evaluated with CCP-0 set to its mean (28.44)

range of CCP-0 averages among the groups of participants assigned to different experimental conditions, inclusion of the covariate accounted for the variation in starting point.

[25] Scale was -10 to +10.

*Does Support for Attacking the Target Vary with the Absence of Likely Harm?*

The main effect of HARM ($H_2$) was also significant whether measured against ATTACK or INTENSITY. An ANCOVA of ATTACK by TARGET, HARM, and FRAME with CCP-0 as a covariate revealed a main effect in the anticipated direction ($F(1,160) = 6.78$, $p < .01$). In the low-estimate conditions, 74% of participants indicated their support for the airstrike, while only 57% of those receiving the high estimate supported the attack. Similarly, the effect was also as hypothesized when INTENSITY was analyzed via an ANCOVA using the same approach ($F(1,160) = 8.47$, $p < .005$). The low harm estimate received a support score of 4.09, while the high estimate's mean score was only 1.04.

*Does Attention to Likely Harm Vary with the Target's Benefit?*

As was the case in Experiment 1, analyses of both ATTACK and INTENSITY found no significant interaction of TARGET and HARM. This offered no support for $H_4$ and the expectation that the high target value would lead to less attention to the casualty estimate than the low target value.

*Does a Winning or Losing Frame Affect Support for the Attack?*

FRAME was unable to significantly influence decision outcome, whether analyzed with respect to ATTACK or INTENSITY. $H_4$'s expectation of an effect on risk attitudes, and thus willingness or reticence to attack, went unsupported.

*Does Winning or Losing Affect Support in High-Stakes Dilemmas?*

While FRAME did not generate a main effect across all the experimental conditions, it exerted influence on one of the two outcome dependent variables in the subset consisting of the two high stakes conditions ($H_5$). Caught between the opportunity to attack a very beneficial target and the likelihood of killing a large number of civilians in the process, participants in the losing frame were only slightly more ready to press the attack than those who were in the winning frame. Using the reduced data set consisting of only the cases in Conditions 1 and 5, an ANCOVA of INTENSITY by all three factors showed that individuals in the losing frame expressed 5.25 points of support, whereas those in the winning frame recorded a mean support score of 5.04 ($F(2,38) = 3.89$, $p < .05$). A similar analysis of ATTACK did not find a significant influence of FRAME.

*Does a Winning or Losing Frame Affect Support Under Fool's Bet Conditions?*

This research question was added as result of the empirical results of Experiment 1 that pointed to a reversal of the expected risk attitudes whenever target value was low, yet estimated harm was high—the Fool's Bet conditions. $H_6$ described the expected behavior under this mismatched combination of TARGET and HARM: in the losing frame, participants would be more risk averse and less willing to support the attack than if they had been in the winning frame. Experiment 2 supported this hypothesis. Looking only at the cases in which target value was low, yet estimated harm was high (Conditions 3 and 7), an ANOVA of ATTACK by FRAME showed a significant main effect ($F(2,39) = 9.63$, $p < .001$).[26] The effect was in the hypothesized direction, with 38% of the participants in the winning frame declaring their support for the proposed airstrike, but only 25% of those in the losing frame willing to do so. This was further confirmed by an ANOVA of INTENSITY that showed winning-frame participants posting a mean support score of -2.19, while the losing frame led the other group to average an even lower score of -4.80.[27] Under high stakes conditions, the participants in the losing frame would have been more supportive of the airstrike than those in the winning frame. However, a change of target value from high to low and the Fool's Bet conditions exerted control, reversing the order of the framing effect and making those in the losing frame the source of weaker support.

*Summary of Decision Outcome Results*

Altogether, these results reinforced the clear role of benefit, in the form of target value, and cost, in the form of humanitarian harm, in the outcomes of these decisions about airstrikes. FRAME was not influential in a general way across all conditions, but did post a sizeable effect under the Fool's Bet conditions and a partial effect under the two high stakes conditions. Absent again was the anticipated interactive effect of TARGET and HARM on outcome. The following section will discuss how the three experimental factors were found to influence the decision process. All the factors will again play a role in the process of choice formation, although sometimes in different ways than seen in Experiment 1.

---

[26] An ANCOVA using CCP-0 as a covariate was also run, but the covariate was statistically insignificant.
[27] CCP-0 was not significant in either analysis, so it was excluded in the final analyses.

**Decision Process**

This experiment differed in design from the first because it permitted participants to have greater control over the information they viewed and the timing of their decision. Beginning with Information Item 2, participants were permitted to choose freely between viewing target information and civilian casualty information items. They could also choose to open all 12 of the items, but no fewer than seven items.[28] Several parameters were measured to characterize the varying patterns of information acquisition. These design features permitted the investigation of additional facets of the decision process, including information item selection patterns and speed of decisions. However, flexibility in participants' access of information prevented almost all post-hoc move-by-move comparisons of participant support, as had been done in the analysis of the first experiment. CCP scores could be compared only at Information Item 0 (the scenario introduction) and Information Item 1 (the FRAME manipulation).[29]

The results of the decision process analyses will be discussed in this section, with all three experimental factors exerting significant influence in the evolution of choice. After the effect of FRAME at CCP-1 is presented, the remainder of this section will be structured using the process-oriented research questions introduced in Chapter III.

[28] This lower limit was required, given the experiment's design and coding, to ensure all participants received both the target and the civilian casualty manipulation.
[29] The results of the analysis of CCP-0 responses were used to identify the issue with random assignment as previously discussed. No further analysis regarding CCP-0 will be discussed here.

*Information Item 1 and Prospect Frame*

Information Item 1 introduced the FRAME variations to the participants. Just as in Experiment 1, the CCP-1 score distributions were shaped by the framing manipulation. This main effect was confirmed by an ANCOVA of CCP-1 by FRAME with CCP-0 as a covariate ($F(1,166) = 9.10$, $p < .001$)[30], as well as by a repeated-measure ANOVA of CCP-0 and CCP-1 by FRAME ($F(1,167) = 7.21$, $p < .005$). Figure 5.2 shows how this main effect repeated the pattern found in Experiment 1, where the losing frame drove up the average support level and the winning frame caused a slight drop in support. Because of the first experiment's results, it was not surprising that FRAME had such a distinct effect in isolation from other manipulations, yet not exert any significant influence in the decision outcome. Despite the apparent weakness of the prospect frame's effect in influencing the final choice, FRAME did appear again as a significant influence in additional facets of the decision process.

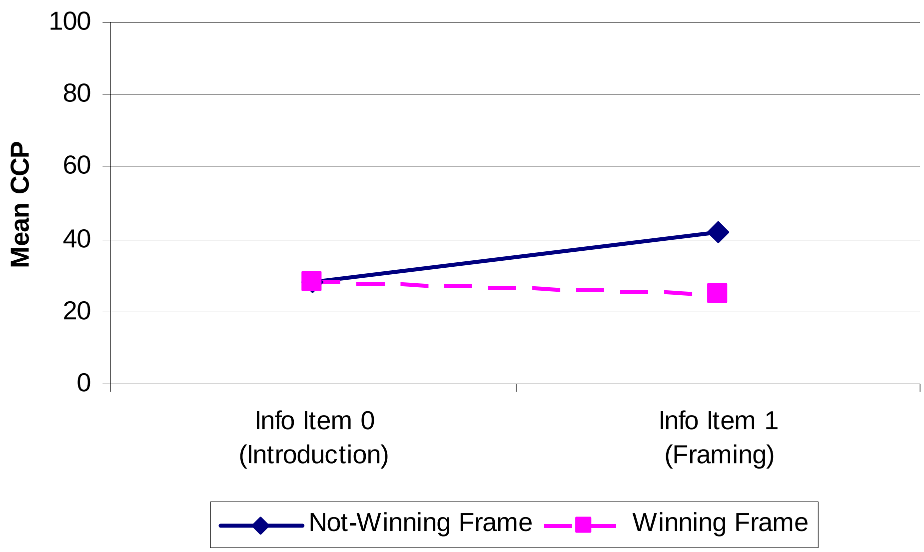
*Does the Sequence of Inputs Matter?*

While participants in the losing frame were expected to be more likely to start off with target information than those in the winning frame ($H_7$), over 90% of the participants across all conditions chose to access target-related information first. Therefore, no conclusions could be drawn about the effect of FRAME on initial information selection. This result could be an artifact of screen design because target information was the top-most of the two options. Order effects are well known in

[30] CCP-0 was also significant ($F(1,166) = 235.397$, $p < .001$) and was held at its mean of 28.44 during the evaluation of frame.

experimental methodology and can only be ruled out when the sequence of options is varied as an experimental manipulation.

**Figure 5.2**
**Effect of FRAME on CCP**
**Across Information Items 0 & 1**

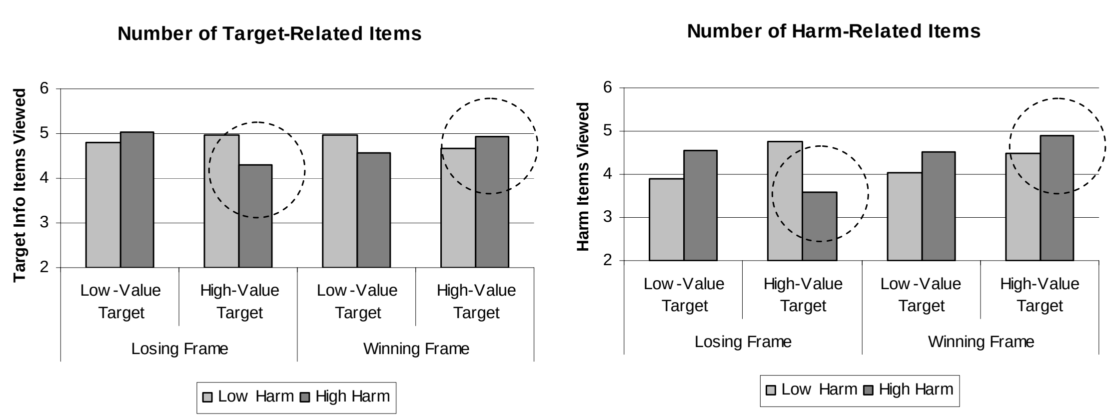



However, after the selection of the first item, FRAME did have the anticipated influence on how long participants continued to view target-related information before switching to the civilian casualty estimate category. Using a reduced data set of only those participants who had started with target information (154 cases), an ANOVA of DIVERT_ITEM by FRAME and TARGET revealed a main effect of prospect framing ($F(1,150) = 3.75$, $p < .05$). Among this subset of participants, those in the losing frame chose to view 1.7 additional items, on average, where those in the winning frame only saw 1.3 more items before choosing to look at their first piece of harm-related information. This result supported the expectation that participants in the losing frame, where gain was most meaningful, would initially seek out more benefit-related target information than would those in the cost-focused winning frame.

*When Do Decision Makers Use More of One Type of Information Than Another?*

When looking at all the information viewed by each participant, the total number of items used in each category varied in a more complex way than anticipated. $H_8$ had predicted a main effect of FRAME. However, an ANOVA of TARGET_ITEMS by all three experimental factors showed an interactive influence of FRAME in concert with TARGET and HARM ($F(1,161) = 4.76$, $p < .05$). An ANOVA of HARM_ITEMS by all three experimental factors pointed to a similar three-way interaction ($F(1,161) = 4.32$, $p < .05$). Figure 5.3 shows the complexity of both of these sets of results.

**Figure 5.3**
**Effects of FRAME, TARGET, and HARM**
**on Number of Information Items Used by Category**



Focusing on the high-stakes conditions offered one way to extract meaningful information contained within the results. These conditions, as marked in Figure 5.3, were distinctive in both analyses. When participants were in the losing frame and had been given both a high-value target and a high estimate of harm, they used the least amount of target *and* harm information of any group on average. Furthermore, the participants in the high-stakes winning frame used the most harm information and were among the four conditions that tied as the biggest users of target information.

Using only the cases in the high-stakes conditions, further analysis was then done to determine if frame operated as hypothesized under these particular circumstances. Both the ANOVA of TARGET_ITEMS by FRAME ($F(2,39) = 333.31$, $p < .001$) and the ANOVA of HARM_ITEMS by FRAME ($F(2,39) = 374.03$, $p < .001$) resulted in a main effect of FRAME. Participants in the domain of loss used, on average, 4.23 items of target information and 3.57 items of harm-related information. This was compared to participants in the domain of gain, who accessed 4.95 pieces of target information and 4.90 items of harm information on average.

Whereas $H_8$ had been based on an expected difference in relevancy as determined by framing and information type across all eight conditions, it is within the high stakes conditions that this effect is seen. There, participants in the losing frame used less of both target-related and harm-related information than those in the winning frame. Yet, the results from the high-stakes conditions also point to a bias between the types of information within the losing frame. Those participants used more target information than harm-related items, while participants in the winning frame used approximately the same amount of items from both categories.

*When Do Decision Makers View Less than All the Information and Make an Early Choice?*

To assist in answering this research question, $H_9$ proposed a test focused on the high-stakes conditions and based on the assumption that information would be used to assess and process risk. Framing would then influence risk attitudes, which in turn would drive total information use: frames of loss creating less of a need for information and winning frames causing participants to desire more information. The high-stakes context was used to ensure the presence of a high degree of risk. In this experiment, a participant's final choice could occur as early as following the seventh item of information or as late as after the thirteenth. The experiment produced results that supported $H_9$. Using only the cases from the high-stakes conditions (Conditions 1 and 5), an ANOVA of TOTAL_ITEMS by FRAME revealed a main effect of FRAME in the expected direction ($F(2,39) = 434.94$, $p < .001$). Participants in the losing frame used an average of 7.86 items of information, just above the minimum number of seven items, while participants in the winning frame used 9.85 items. The results of this test follow directly from those in the preceding paragraph, where the type of information had been expected to matter, but did not in the high-stakes conditions. Instead, it was FRAME that exerted a clear influence on overall information use.

According to the targeting decision model, these results indicate that participants facing both a high-value target and high estimate of harm, on average, had CCPs that were reaching a decision threshold earlier when they were in the domain of loss than in the domain of gain. Also according to the model, this speed of decision was due to some combination of threshold position, the amount of information, and the valence and relevancy of that information.

Corroboration of this result was available by looking at the TOTAL_TIME variable. This measurement captured the elapsed time from Information Item 1 until the final decision by each participant and so offered another way to assess speed of decision. TOTAL_TIME, however, was not a direct measure of the amount of information, but incorporated time spent processing each item accessed. Using the same high-stakes subset of conditions, an ANOVA of TOTAL_TIME by all three experimental factors revealed the expected influence of FRAME ($F(2,39) = 196.30$, $p < .001$). Participants facing both a high-value target and a high civilian casualty estimate were noticeably quicker to make a decision when they were in the domain of loss (mean of 214.8 seconds) than in the domain of gain (mean of 246.9 seconds).

*Summary of Decision Process Results*

Knowing the frames in which participants had been placed was the key to successfully predicting how they would work through the decision process in order to arrive at their choice. The targeting decision model expected that a frame of loss would result in risk-acceptant decision makers who would be more focused on target information, less interested in information as a whole, and faster to reach a decision. All of these expectations found support, although sometimes qualified by the necessary presence of high risk in the form of a dilemma pitting a high-value target against a high estimate of civilian casualties. Yet it was in these high-stakes conditions that the results could be the most surprising if one expected decision makers faced with difficult dilemmas in contexts of high risk to deliberate long and hard over their choice. Instead, Experiment 2 has shown that framing and risk attitude have substantial influence over information use and time, even in those difficult circumstances. This result becomes more remarkable when compared against the mean number of items used by each of the other six conditions. This reveals that the two high-stakes conditions used the least items of information of all the conditions.

SUMMARY

The results of the second experiment were very similar and complementary to those of the Experiment 1 and so increased confidence in the targeting decision model. Target values and estimates of civilian casualties were again substantiated as the key influences on decision outcome. However, framing again influenced the decision process and came to the fore under the particular circumstances of high-stakes and Fool's Bet conditions.

Experiment 2 was specifically designed to permit participants greater flexibility in accessing information and in determining when they were ready to make their decisions. This enabled the investigation of additional decision process parameters, the results of which increased the level of understanding about the formation of choice. The results clearly centered on the role of framing involving prospects for success or failure in the conflict, as well as the associated risk attitudes and considerations of information relevancy imparted by those frames. While almost all of the participants began their search for input with target-related information, prospect framing was a major influence in how long they continued to view target information. When placed in the stressful dilemmas of the high-stakes conditions, framing was a major determinant of how much information participants used prior to their decision. Additionally, framing helped determine how quickly participants moved to make a choice.

The following chapter will take the concepts of cost, benefit, and attitude toward risk out of the laboratory and seek evidence of their influence in a historical event involving decision makers from a different democratic setting. This next analysis sacrifices precise control over conditions and participants to gather evidence that the hypothesized and experimentally documented relationships operate also in the real world.

# CHAPTER VI

# HISTORICAL DATA ANALYSIS:

# DESIGN, HYPOTHESES, AND RESULTS

This chapter presents a different approach to testing aspects of the targeting decision model. Following the two experiments, this analysis is intended to seek evidence that the model helps to explain behavior outside of the laboratory and within real international conflict. However, one of the primary reasons the targeting decision model was initially tested using experimental methods was the unavailability of detailed historical data documenting the inputs to, and outcomes from, actual targeting decision processes. This constraint led to the search for observational data that could be used to test the model from outside the process. Direct knowledge of exact targets, their perceived value, or a-priori estimates of civilian casualties would be extremely limited, if available at all.

The source of these data was found in the Palestinian-Israeli conflict known as the second Intifada. In this conflict, as in others, the weapons of war could be used in ways that either maximized the likelihood of destroying the target or sacrificed some of that certainty in order to minimize harm to nearby civilians. A unique aspect of the second Intifada was the data available on both the terror attacks by Palestinians against Israelis and the Israeli military operations against the Palestinians. The resulting statistical analysis focuses on Israeli decision making in this exchange and poses the following question: *Given that a decision to attack was made, did the value of the target* *and the type of prospect frame affect Israeli sensitivity to the likely cost in Palestinian civilian casualties?* The results provide an indication that both target value and prospect frame may affect the incidence of civilian casualties in the real world in a manner consistent with the targeting model and as shown by the two experiments. Furthermore, this evidence comes from the decision-making process of a democratic country other than the United States, pointing to the potential generalizability of the model.

This chapter will first describe how the statistical test was designed, to include a discussion of the data, the model, the variables, the hypotheses, and the statistical method. Following this the results will be presented.

## DESIGN

This section will proceed in four parts. The first will discuss how the structure of this analysis was designed using the targeting decision model. Next, the data sources will be described. The following paragraphs will then present the variables, the detailed statistical model, and the hypotheses. Finally, the method of analysis selected will be justified and described.

### Testing the Targeting Decision Model

The structural view of the targeting decision model presented in Chapter III (see Figure 3.1) expected inputs in the form of context, benefits, and costs that were then combined into a decision either to *attack* or *not attack*. Using these conceptual terms, the targeting decision model was expressed in a dynamic manner as the following equation:

$$Attack\ Decision_t = Benefits_t + Costs_t + Context_{t\text{-}\lambda} + c$$

In this equation, or conceptual model, the attack decision, the benefits, and the costs were all coincident in time. The timing of the context inputs was more flexible since preceding events could have lasting impacts on the decision environment. Yet, this equation was not amenable to direct testing using observed data for two reasons. First, only decisions that resulted in attacks on a target would produce observable results, permitting inference that the *attack* decision occurred. However, *do-not-attack* decisions would not be likely to produce any externally observable indications. This limitation would prevent any test of the model that posed questions about whether or not an attack did or did not occur. Thus, the conceptual model above was modified to reflect the assumption that it would only describe attacks that had taken place. This was done by reducing the left-hand side of the equation to a constant and rearranging terms as shown below:

$$Costs_t = Benefits_t + Context_{t\text{-}\lambda} + c \qquad \underline{\text{GIVEN}}\text{: Decision to attack}$$

In this revised conceptual model that presupposes an *attack* decision, the expected costs and benefits now represent the values upon which the choice to attack was based. This decision, according to the law of war, is made via determinations of military necessity and proportionality. If the target offers a significant enough benefit toward victory, it can be deemed militarily necessary. That benefit is then traded off against the anticipated harm to civilians in order to determine proportionality. For an *attack* decision to result, the anticipated benefit should outweigh the cost. However, the influence of context is not mentioned in the law of war as a component of the proportionality determination, yet is expected by the conceptual model to play a key role in the process. As reflected in the targeting decision model and seen in the two experiments, the context input of prospect frame can affect the risk attitudes of decision makers and influence both how and what they decide. Thus, the conceptual Intifada model reflects the costs, benefits, and context that resulted in the choice to attack.

Second, the conceptual model was not ready for testing because both the original and the revised equations required specific information about the anticipated benefit of the target being considered and the predicted risk of civilian casualties in the course of the strike. These kinds of information were considered protected data by their respective governments, so were not available for use in this test. This required the location of externally observable proxy measures for these important variables. Data for the context inputs in the conceptual model was expected to be less difficult to find.

## Data

The necessary data was found in databases the coincided with a multi-year period of the second Intifada, an uprising of the Palestinians against the Israelis that began in 2000 and continued up to this writing. Within that conflict, a very active period from September 23, 2000 to December 20, 2006 was selected for analysis. That time period was marked with numerous terror attacks by Palestinian militants against Israel and by frequent military operations by Israel against the militants. These Israeli military responses often resulted in Palestinian civilian casualties. Another reason this historical event was a good candidate for evaluation was the democratic form of government in Israel.

Furthermore, proxies were available from among these data to represent the cost, benefit, and context terms in the conceptual model of attacks. By assuming that actual results were acceptable estimates of a-priori expectations, the number of actual Palestinian civilian deaths could be used to populate the cost term. Similarly, the number of actual Palestinian militant deaths, whether killed by general military operations or individually targeted, could suffice to fill in the benefits term. For contextual inputs, the frequent terror attacks on Israeli soil could be expected to affect the decision environment of Israeli political and military leaders. Also, three Israeli elections during the period were also anticipated to be pertinent events affecting the context of Israeli decision making. These selections for model inputs will be explained more below.

Event data for terrorist attacks during the second Intifada were found in the Terrorism Knowledge Base® assembled by the Memorial Institute for the Prevention of Terrorism (MIPT 2007). Event data for civilian casualties were drawn from the extensive second Intifada fatalities database built by *B'Tselem: The Israeli Information Center for Human Rights in the Occupied Territories* (B'Tselem 2007). This database recorded individual deaths accompanied by a number of descriptive parameters. This data was the most detailed source found to date and the only one that could serve as a means to approximate the count of Palestinian civilian deaths.

Over 99% of the Palestinian attacks against Israeli targets during this period were against non-military targets such as Jewish settlements within the Occupied Territories, small Israeli towns, or the large metropolitan centers of Israel. The intensity of these terror attacks ranged from the firing of rifle shots and mortar bombs in isolated areas to suicide bombers and car bombs in large urban centers. In response, the Israeli government launched over 200 airstrikes and mounted frequent ground operations aimed at Palestinian militants and leaders during that period. Table 6.1 provides a high-level description of the events reflected in the data.

The entries in the B'Tselem casualty database that were useful for this test were date, cause of death, whether the person "died while fighting," whether the Israeli operation was a targeted killing, and, if so, whether the casualty was the targeted individual. Individuals were not overtly labeled as civilians in the database, but were coded this way in the dataset for research purposes if the victim neither died while fighting nor was the object of a targeted killing. The MIPT terror database offered the following useful entries: date, location, and number killed.[31] No information was available that directly described the number or nature of Israeli military missions during this period. However, Israeli forces were continuously present in the Occupied Territories throughout this period, so operations were considered to be continuous.

These data were used to build a set of daily cases that documented both the terror attacks by Palestinians against Israelis, as well as the Palestinian casualties that resulted

[31] Number of Israelis injured by the terror attacks was also available, but was highly correlated with the number killed, so was not included in the analysis. Since Palestinian injuries were not included in the B'Tselem casualty database, the model's focus on fatalities is the same on both sides of the conflict.

from Israeli military operations on each day. The time interval of a single day was the shortest possible given the two databases that were merged. Additional consolidation was not done in order to maximize the detail of the dataset.

**Table 6.1**
**Summary of Scope of Second Intifada Data Set**

| Number | Descriptor |
|---|---|
| 187 | Terror Attacks in Core Areas of Israel |
| 671 | Terror Attacks in Periphery of Israel |
| 1694 | Terror Attacks in Occupied Territories |
| 1145 | Israelis Killed by Terror Attacks |
| 4739 | Israelis Injured by Terror Attacks |
| | |
| 1915 | Palestinian Civilians Killed* by Israeli Military Ops |
| 1246 | Palestinian Militants Killed* by Israeli Military Ops |
| 210 | Palestinian Militants Killed via Targeted Killing |
| | |
| 2307 | Days in Data Set |
| 837 | Days with ≥1 Palestinian Civilian Fatality |
| 546 | Days with ≥1 Palestinian Militant Fatality |
| 108 | Days with ≥1 Targeted Killing of Palestinians |
| 304 | Days with ≥1 Israeli Death from a Terror Attack |
| 167 | Days with ≥1 Terror Attack in Core Areas of Israel |
| 477 | Days with ≥1 Terror Attack in Israel (Periphery) |

Data set spans the period from 8/27/00 to 12/20/06

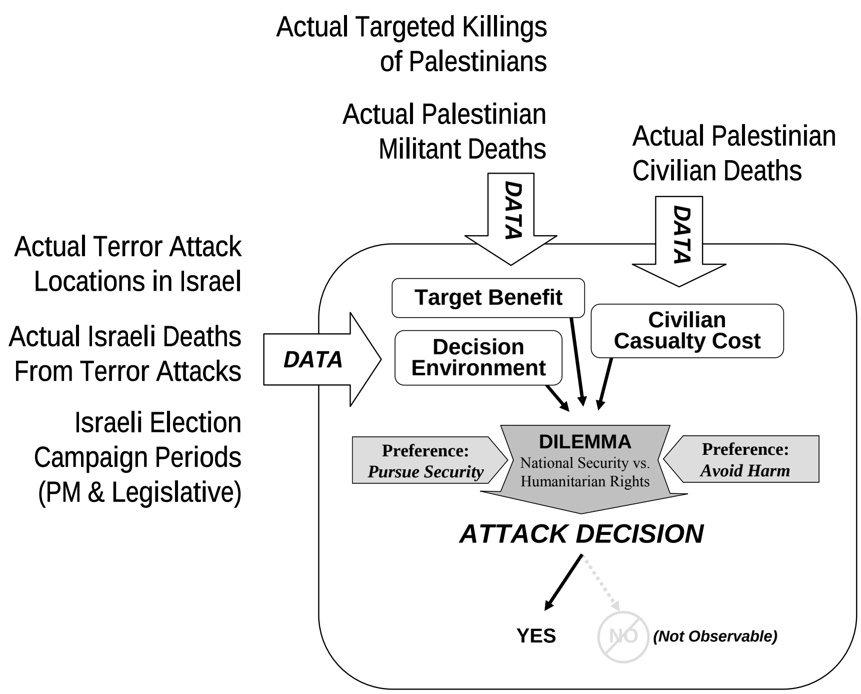
## The Intifada Harm Model, Variables, and Hypotheses

Bringing together the conceptual model described above and the available data resulted in the following model of harm in the second Intifada:

$$\overbrace{CIV\_DEAD_t}^{\text{Cost}} = \underbrace{\beta_1\, MILITANT\_DEAD_t + \beta_2\, TARGETED\_KILL_t}_{\text{Benefits}} \underbrace{+ \beta_3\, TERROR\_DEAD_{t-\lambda} + \beta_4\, LOCATION\_CORE_{t-\lambda} + \beta_5\, LOCATION\_PERIPHERY_{t-\lambda} + \beta_6\, LEGIS\_CAMPAIGN_t + \beta_7\, PM\_CAMPAIGN_t + \beta_8}_{\text{Context}}$$

Also, a graphical depiction of how the data and the model were merged appears in Figure 6.1.

**Figure 6.1**
**Intifada Data and Targeting Decision Model**




The dependent variable, CIV_DEAD, represented humanitarian cost and was populated by the daily count of Palestinian civilian deaths. Table 6.2 displays the mean and range of this variable and the seven independent variables about to be described. While the structural view of the targeting decision model lists other potential contributors and considerations regarding cost, this model focuses solely on the humanitarian aspect. This fosters a parallel construct with the experimental scenarios where humanitarian harm was the only component of cost that was manipulated.

**Table 6.2**
**Per-Day Mean and Range of Variables**
**in Intifada Harm Model**

| Independent Variable | Mean | Minimum | Maximum |
|---|---|---|---|
| Cost Term | | | |
| CIVILIAN_DEAD | .83 | 0 | 23 |
| Benefit Terms | | | |
| MILITANT_DEAD | .54 | 0 | 12 |
| TARGETED_KILL | .09 | 0 | 6 |
| Context Terms | | | |
| TERROR_CAS (3 days) | 1.49 | 0 | 59 |
| LOCATION_CORE (3 days) | .24 | 0 | 5 |
| LOCATION_PERIPHERY (3 days) | .87 | 0 | 13 |
| LEGIS_CAMPAIGN | (Dummy) | 0 | 1 |
| PM_CAMPAIGN | (Dummy) | 0 | 1 |

Additionally, there is anecdotal evidence that humanitarian harm mattered to Israeli decision makers while attacking Palestinian adversaries during this timeframe. Blumenfeld (2006) described Israeli military and political leaders struggling under a difficult targeting dilemma. Based on an interview of the then-chief of the Israeli Air Force, these leaders were described as they considered both target benefit and civilian casualty cost in the course of an opportunity to attack a long-wanted terrorist mastermind. According to the account, the leaders eventually decided to forgo the attack because of the potentially high number of civilian casualties involved.

The right-hand side of the equation represented the following assumptions and operationalizations based on the available data. The first two independent variables together represented the estimate of the anticipated benefit of Israeli military operations on a given day. MILITANT_DEAD was taken directly from the conceptual model and held the daily count of Palestinian militants killed. Each MILITANT_DEAD value corresponded to the same day as the CIV_DEAD value. CIV_DEAD was expected to be positively related to MILITANT_DEAD because higher amounts of humanitarian harm should be justified by greater amounts of military benefit in order to be considered proportional.

- $H_{11}$ (Military Operations) – The daily number of Palestinian civilian fatalities will be positively related to the number of Palestinian militants killed on that same day.

Benefit was also represented in the operational model by TARGETED_KILL, the number of Palestinians who died each day because they were singled out by an Israeli military operation referred to as a *targeted killing*. Since this type of operation was used for high-value targets, this variable served to indicate when the benefit of military operations for a given day was expected to be large. TARGETED_KILL was indexed to the same day as CIV_DEAD. CIV_DEAD was expected to increase as TARGETED_KILL and expected benefit went up, reflecting the same type of proportionality-related interaction between target and harm that had been seen at points in the experimental results.

- $H_{12}$ (High-Value Target) – The daily number of Palestinian civilian fatalities will be positively related to the number of Palestinian militants who were objects of targeted killings on that same day.

TERROR_DEAD, LOCATION_CORE, and LOCATION_PERIPHERY were all operationalizations of the context input and reflected prospect framing. These variables were based on the assumption that terror attacks would induce a frame of loss, while the absence of terror strikes would result in a frame of gain. However, not all terror attacks were expected to exert equal influence in this way. As terror attacks killed more Israelis, and as these attacks occurred closer to the heartland of Israel, their ability to induce a negative frame would be greater. TERROR_DEAD counted the number of Israelis killed daily. LOCATION_CORE tracked the number of terror attacks that occurred in the core areas of Israel, defined to be Jerusalem, metro Tel Aviv, and Haifa. LOCATION_PERIPHERY did the same for the remainder of Israel, excluding the Occupied Territories.[32] All three of these terms were not indexed to the same day as CIV_DEAD, but held the cumulative total of their descriptor over the previous three

[32] A third variable, LOCATION_OT, held the counts of terrorist attacks in the Occupied Territories. It was not included in the model to avoid multicollinearity.

days.[33] CIV_DEAD was expected to increase as TERROR_DEAD, LOCATION_CORE, and LOCATION_PERIPHERY increased, shifting the frame in a negative direction, making Israeli leaders more risk acceptant, and making potential civilian harm less relative.

- $H_{13}$ (Terror Event Casualty Framing) – The higher the number of Israeli fatalities and injuries due to terror attacks over the previous three days, the higher the number of Palestinian civilian fatalities that are expected to occur during military operations on a given day.
- $H_{14}$ (Terror Event Location Framing) – The higher the number of terror attacks in the core of Israel over the previous three days, the higher the number of Palestinian civilian fatalities expected to occur.

The final two variables in the model, LEGIS_CAMPAIGN and PM_CAMPAIGN, were also context inputs, but were not associated with prospect framing. Instead, they explored the role of another aspect of the decision environment from the targeting decision model: the domestic feedback loop. The expectation was that the manner in which Israeli decision makers conducted military operations would be affected by the reelection campaigns as these sitting leaders sought votes. During the six-year period spanned by the data, two legislative elections and one special election for prime minister occurred in Israel.[34] The legislative election campaign periods were limited by law to the 101-day timeframe preceding the election (Library of Congress

[33] Sensitivity tests were performed using other individual day lags and cumulative lags up to 2 weeks .The 3-day cumulative lag was the most reasonable and was significant in the model.
[34] The two legislative election dates were January 28, 2003 and March 28, 2006. A special election for prime minister took place on February 6, 2001.

2009). The election for prime minister was preceded by a 60-day campaign period.[35] LEGIS_CAMPAIGN and PM_CAMPAIGN were dummy variables that indicated the presence or absence of their respective campaign period. Public attitudes of the Israeli public and the incumbents would be critical to predicting the direction of the effect of a political campaign period on CIV_DEAD. This background work was left for future research and no hypotheses for the campaign variables were formulated.

**Method of Analysis**

The Intifada harm model posed two related challenges to analysis. First, the model sought to account for a dynamic process. The expectation was that prospect frame and the decisions to respond with military force were contingent on terror attacks that had already occurred. Because this process was unobserved, the length of time that mattered between terror attack and military response was not empirically apparent. Second, the independence over time of Israeli decisions regarding military responses was uncertain. Given that there were likely to be multiple terror attacks within a period of time, the role of previous Israeli decisions and the outcomes of those decisions would reasonably impact a current choice.

Similarly, there were several characteristics of the data that also influenced the choice of the means of statistical analysis. First, the civilian casualty dependent variable was composed of discrete counts. According to Greene (2003, 663), conventional regression is not a generally suitable approach for this type of data. Next, the data was

[35] The special election was precipitated by the resignation of the incumbent on December 9, 2000.

aggregated at the daily level in order to maximize the information content and time precision within the available data. However, this highlighted a rare events issue in the data: the dependent variable field contained mostly zeros. Within the data set there were 2307 days, but only 837 of those days contained one or more civilian casualties, leaving 64% of the field as zeros. This problematic situation can lead to both bias and selection effect problems in the analysis results (King and Zeng 2001, 693).[36]

Because of the count-nature of the dependent variable, the Poisson regression model (PRM) was the first model considered. This statistical model is based on the Poisson distribution, a univariate set of curves determined by the equation below and by the value of $\mu$, the single value of both the distribution's mean and variance, as shown below:

$$\Pr(y_i \mid \mu_i) = \frac{e^{-\mu}\mu^{y_i}}{y_i!} \quad \text{where } \mu_i = e^{-\mathbf{x}_i\beta}$$

The PRM allows each observation to have its own value of $\mu$ to incorporate observed heterogeneity, or variations, inherent across the data (Long and Freese 2003, 251 and 266). However, Long and Freese caution that the PRM rarely fits the data because it underestimates the amount of heterogeneity that still remains in the data. This causes the data to be overdispersed with respect to the PRM's outcome (Long and Freese 2005).

[36] Although King and Zeng discuss this and the finite sample problem in the context of probability models, the difficulty posed to event count models is expected to be much the same.

Furthermore, the results will give overly large *Z* values and overly small *p* values because the standard errors will be biased downward.

The second model considered was the negative binomial regression model (NBRM), which was designed to correct the weaknesses of the PRM (Long & Freese 2005). Greene (2003, 744) points out that the NBRM improves fit by relaxing the assumption that the mean and the variance of each observation must be the same. Long and Freese (2005) explain that while the NBRM retains the assumption that the counts are distributed as a Poisson, it adds an uncorrelated error term that is drawn from a gamma distribution to model the additional heterogeneity missed by the PRM. This causes the resulting probability model to be a negative binomial distribution in terms of $\alpha$, the measure of the dispersion in the data. This statistic can then be used as test statistic to determine whether overdispersion is present and the NBRM is justified over the PRM.

When the operational model was estimated using the NBRM, $\alpha$ indicated that the NBRM provided a better fit than the PRM. In some cases, zero-inflated models are necessary to properly handle a high-zero-count process. Long and Freese (2005, 274) explain that these approaches use two separate zero-generating processes: one models observations that are always zero, the other models observations that are not always zero. However, when a zero-inflated negative binomial (ZIBN) method was used to fit the operational model, the Vuong test, advocated by Greene (2003, 751), indicated that the NBRM was preferred over the ZIBN.

RESULTS

When the operational model was estimated using the NBRM, all but two terms were significant (see Table 6.3). The two insignificant terms were LOCATION_PERIPHERY and PM_CAMPAIGN. Of the remaining independent variables, TARGETED KILL was the most strongly correlated with CIV_DEATHS, with an incidence rate ratio (IRR) of 1.45 ($Z = 5.18$, $p < .001$).[37] This is an important result. Not only did increased target benefit raise the acceptable number of civilian casualties ($H_{12}$), but its impact on the cost term was larger than any other variable in the model. The count of militant deaths posted the second-highest positive relationship with the dependent variable (IRR = 1.35, $Z = 10.84$, $p < .001$). The role of MILITANT_DEAD was in accordance with $H_{11}$: the higher the number of militants killed on a given day, the higher the number of civilians killed as well.

The location of a terror attack in the core areas of Israel also reflected a relatively strong correlation with the dependent variable (IRR = 1.20, $Z = 2.60$, $p < .01$), although that of the number of fatalities from terror attacks was significant, but markedly weaker (IRR = 1.02, $Z = 2.33$, $p < .05$). $H_{13}$ and $H_{14}$ anticipated that such attacks in the core and fatal attacks during the previous three days would drive a negative frame for decisions about Israeli military responses, making them more likely to result in civilian casualties. These results show that in the case of the second Intifada the location of terror attacks in the "heart" of the country had a stronger impact than the lethality of terror attacks. Finally, Israeli legislative election campaigns were associated with a substantial drop in

[37] The IRR provides the expected change in the dependent variable given a one-unit change in the independent variable.

Palestinian civilian casualties (IRR = .68, Z = -2.49, p < .05). This result offers interesting fodder for future research into the role of domestic feedback in this particular conflict and its targeting decision process.

**Table 6.3**
**Contributions of Independent Variables to Intifada Harm Model**

| Independent Variable | Coefficient | *Z* | *p* | *Incident Rate Ratio* |
|---|---|---|---|---|
| MILITANT_DEAD | .301*** | 10.84 | .000 | 1.35 |
| TARGETED_KILL | .369*** | 5.18 | .000 | 1.45 |
| TERROR_DEAD # | .021* | 2.33 | .020 | 1.02 |
| LOCATION_CORE # | .180** | 2.60 | .009 | 1.20 |
| LOCATION_PERIPHERY # | .013 | .55 | .580 | 1.01 |
| LEG_CAMPAIGN | -.381* | -2.49 | .013 | .68 |
| PM_CAMPAIGN | -.514 | -1.81 | .070 | .60 |
| Constant | -.603*** | -11.45 | .000 | -- |

* *p* < .05  ** *p* < .01  *** *p* < .005
\# Cumulative count over the previous 3 days

Table 6.4 displays various scenarios posed to the Intifada harm model, as well as the number of civilian casualties it predicted. Also provided is the expected probability of one or more civilian casualties given the values of the independent variables. These predictions were generated using the PRVALUE post-estimation command written for Stata by Long and Freese (2005). While the IRR values discussed above are one way to understand how each right-hand-side variable affects the model's output while holding other variables at their means, PRVALUE permits the researcher to control the value of all inputs simultaneously in order to explore specific circumstances.

**Table 6.4**
**Impact of Harm of Modeled Intifada Scenarios**

| | Scenario | Estimated Civilian Casualties[#] | Pr $\geq$ 1 Civilian Casualty[#] | Change in Probability From Average Day | MILITANT_DEAD | TARGETED_KILL | TERROR_DEAD[##] | LOCATION_CORE[##] | LEGIS_CAMPAIGN | PM_CAMPAIGN |
|---|---|---|---|---|---|---|---|---|---|---|
| Incrementing Each Independent Variable | Average Day | .73 | .369 | --- | $\mu$ | $\mu$ | $\mu$ | $\mu$ | 0 | 0 |
| | +1 Militant Casualty | .98 | .429 | +.060 | $\mu$ +1 | $\mu$ | $\mu$ | $\mu$ | 0 | 0 |
| | +1 Targeted Killing | 1.05 | .442 | +.073 | $\mu$ | $\mu$ +1 | $\mu$ | $\mu$ | 0 | 0 |
| | +1 Terror Casualty | .74 | .373 | +.004 | $\mu$ | $\mu$ | $\mu$ +1 | $\mu$ | 0 | 0 |
| | +1 Terror Attack in Core | .87 | .405 | +.036 | $\mu$ | $\mu$ | $\mu$ | $\mu$ +1 | 0 | 0 |
| | Active Legislative Election Campaign | .50 | .297 | -.073 | $\mu$ | $\mu$ | $\mu$ | $\mu$ | 1 | 0 |
| | Active Prime Minister Election Campaign | .43 | .273 | -.096 | $\mu$ | $\mu$ | $\mu$ | $\mu$ | 0 | 1 |
| More Terror | 1 Terror Attack in Core with 5 Deaths | .90 | .411 | +.042 | $\mu$ | $\mu$ | 5 | 1 | 0 | 0 |
| | 2 Terror Attacks in Core with 20 Deaths | 1.47 | .509 | +.140 | $\mu$ | $\mu$ | 20 | 2 | 0 | 0 |
| | 5 Terror Attacks in Core with 59 Deaths | 5.70 | .734 | +.365 | $\mu$ | $\mu$ | 59 | 5 | 0 | 0 |
| More Targeted Killings | 3 Targeted Killings | 2.13 | .579 | +.210 | $\mu$ | 3 | $\mu$ | $\mu$ | 0 | 0 |
| | 6 Targeted Killings | 6.44 | .745 | +.376 | $\mu$ | 6 | $\mu$ | $\mu$ | 0 | 0 |

[#] Estimated using PRVALUE (Long and Freese 2005)
[##] Sum of events over previous 3 days
$\mu$ = mean across entire period in data set

The uppermost section of Table 6.4 increments each independent variable separately to characterize their individual effects. The magnitudes of the effects are relatively the same as the IRR values in Table 6.3. The bottom two sections show what might be expected if either terror attack or targeted killings increased. In the first set, one, two, or five terror attacks occurred in the core areas of Israel in a three-day period. Each attack was accompanied by 5, 20, and 59 fatalities, respectively. The upper ends of these characteristics were the maximums that appeared in the data set. In these scenarios, the predicted number of civilian casualties on that day grew from 0.9 to 5.7. In the last set, either three or six targeted killings occurred. These raised the expected number of Palestinian civilian casualties to 2.1 and then 6.4.

Because this is a correlational analysis, there is the possibility that the variation in civilian casualties is not due to different sensitivities to the costs, as has been expected in the hypotheses here. A possible alternative explanation for the correlation between militant and civilian deaths is the realities of urban warfare: when combatants and noncombatants are intermingled, the number killed from each category will be linked. If this is the case, then the MILITANT_DEATH term would offer no support for the existence of the expected benefit-cost tradeoff. However, this same explanation would not explain the stronger positive relationship between the numbers of targeted killings and civilian casualties. Here, the expected larger benefit of these targets was proportional to the higher number of civilian casualties per targeted killing—a result that is not consistent with the co-location rationale.

However, another possible mechanism that might be in operation to explain the relationship of harm to targeted killings is the type of weapons used. If the weapons used to kill high-priority targets were very powerful and inherently indiscriminate this could account for the larger number of civilian deaths that were associated with targeted killings. Yet, these strikes are planned in advance, during which weapons are selected from an array of possibilities. The fact that a particular weapon is likely to result in greater damage to a target's surroundings is known to the decision maker, yet the weapon is chosen despite the likely humanitarian harm. Thus, the selection of the weapon is in itself a statement of sensitivity to the cost of civilian casualties.

## SUMMARY

This chapter has explained the design and test of a statistical model of civilian casualties during a six-year period of the second Intifada. Central in this dynamic Intifada harm model was an unobservable process where Israeli political and military leaders chose how to conduct military operations creating varying degrees of risk of Palestinian civilian casualties. This process was assumed to work in accordance with the structural view of the targeting decision process.

Based on the decision inputs of benefit and context, the statistical model estimated the cost in term of the number of Palestinian civilian casualties which Israeli decision makers were willing to incur in the course of their military operations. This was done using a daily data set of event counts and a negative-binomial estimator. The two decision inputs with the strongest positive relationships to the resulting number of civilian casualties were target benefit, as represented by the number of targeted killings, and losing frame, in the form of the count of terror attacks in the core areas of Israel. These results supported the expectations of the targeting decision model. Higher benefits from attacking were anticipated to drive up civilian casualties as decision makers acted to secure those benefits with less regard to cost. Attacks in the "heart" of Israel were also expected to place decision makers in the domain of loss, where they would be risk prone and find cost-related information to be less relevant. The outcome was anticipated to be higher civilian casualty rates, which proved to be the result.

Of particular note is that the rate of civilian casualties resulting from terror attacks in the core of Israel was higher than that from targeted killings. This points to prospect frame being a stronger influence than target benefit, given the assumptions of the model. In the experimental tests of the targeting decision model, target benefit exerted a significant influence on the decision to attack or not, while prospect frame was statistically not significant in this choice. Therefore, the Intifada harm model has not only provided evidence of the target decision model operating in an actual conflict and in an international setting, but also pointed to prospect frame operating as theoretically expected.

What this analysis has not addressed are issues related to decisions not to attack. It cannot help to characterize the points at which costs are too high or benefits are too low that a planned attack is cancelled. Additionally, some will recognize that the urban environment of the second Intifada, by itself alone, would be expected to increase the rate of civilian casualties. While this is true, the fact that the rate of harm varies with target value, and especially the high payoffs expected from targeted killings, supports the hypothesis that civilian casualties are also a function of the benefit expected by the Israelis from their military operations. Another distinct shortcoming of the dynamic count model used in this test is its inability to correct for autocorrelation in the data. Brandt et al. (2000) and Brandt and Williams (2001) critique the use of Poisson and negative binomial estimators to evaluate time-dependent data because of the inability of these models to account for recurring time dependencies in the data. Instead, they recommend the Poisson Exponentially Weighted Moving Average (PEWMA) or the Poisson Autoregressive (Poisson AR(p)) models. However, refinement of the Intifada harm model using these improved models is left for future research.

Given these caveats, the results from analyzing the data from this conflict provide an interesting insight into a possible mechanism behind some of the previous research results discussed in Chapter II. Valentino, Huth, and Croco (2006) and Downes (2007) all pointed to democracies as significant sources of civilian casualties in war, despite the liberal values of these states. However, if one considers determinations of proportionality to be not only matters of costs and benefits, but also of context, the higher rates of humanitarian harm at the hands of democracies may be more easily explained. This connection will be further discussed in the final chapter.

# CHAPTER VII

# SUMMARY AND CONCLUSIONS

This dissertation sought out insights into the micro-foundations of wartime decision making by democratic governments in the face of likely, but unintended, harm to foreign civilians. This concluding chapter will review the motivation for this research, highlight the influences and conditions found to affect these decisions, and discuss implications for theory, methods, and policy. It will then close with a focus on the next steps in continuing this research.

## MOTIVATION AND APPROACH

A governmental leader faces a quandary. His democratic nation is at war and its military forces have located an important enemy military target for which they have been searching a long time. Yet, because of the target's location, attacking it will also risk killing a substantial number of local civilians. Aware of the precepts of Just War and international law that require proportionality between benefit and cost in situations like this, he considers his alternatives. The leader would like to wait for another opportunity that is unencumbered by the risk of civilian casualties, but is told that the target will move soon and there is no guarantee that it can be located again. The leader asks for attack options and is told that a single one-ton bomb is highly likely to destroy the target, but also will kill many civilians. Alternatively, a smaller bomb could be used to reduce the civilian casualties, but would also make the escape of the target more likely. A request for legal counsel returns only a response that, given the target and the broad bounds of discretion permitted by international law, either one of the options is legal. To maximize his nation's security, should he destroy the target, knowing that this will kill many civilians who are his responsibility to protect? To uphold his nation's beliefs in the value of the human lives threatened by the attack, should he allow the target to escape to fight against his nation again? Try as he might, he cannot find a third, more acceptable option to resolve this dilemma.

How does the leader make this choice? How do similar political and military leaders in other democracies make decisions about how they will fight when faced with dilemmas between national security and humanitarian harm? To assist in answering these questions, this dissertation constructed a targeting decision model that described both the theorized structure of the decision inputs and the process by which these inputs are assembled into a choice. The model reflected decision inputs in the form of the benefits to be gained from the target, the costs of likely civilian casualties, and the context of the decision. One component of the context input that was of particular interest was the decision frame, as adapted from prospect theory (Kahneman and Tversky 1979). According to this theory, frames of gain will lead decision makers to be risk adverse, while frames of loss will cause them to be more accepting of risky options. The targeting decision model also based its explanation of how a choice evolves on the precepts of Cognitive Calculus (Geva, Mayhar, and Skorich 2000), depicting the evolution of the decision as an online process that incorporates each new piece of information serially. Each information item then moved the decision maker closer to one of two decision thresholds. Reaching a threshold made the choice and stopped the decision process.

This model was then tested using two experiments and a statistical analysis of data collected from an actual conflict. The experiments took 355 experienced military officers and DoD civilians and exposed them to a short wartime targeting scenario in which they were given a high- or low-value target and a large or small estimate of likely civilian casualties. The participants were also given a description of either their current prospects for success or for failure in the conflict. Combinations of these three factors—target value, humanitarian harm, and prospect frame—created eight experimental conditions in light of which the participants' *attack* or *not-attack* choices were evaluated. In order to maintain the necessary level of experimental control, all participants made their decisions having been told that additional options were not available, that their targets were legal under international law, and that the expected civilian casualties were deemed to be proportional by the legal experts.

The first of these two experiments ensured that all participants saw the same sequence of information items and only made their decisions about attacking the target at the end. Participants self-reported their CCPs after each item, indicating the decision toward which they were leaning and how strongly they felt about that position. This format permitted clear comparisons of the effects of target, harm, and frame on these CCPs across all eight conditions. The second experiment modified this format to permit investigation of how each of the combinations of target, harm, and frame would influence the participants' search for information and the timing of their decision. Using this approach, participants were permitted a greater degree of flexibility both in selecting information to view and in choosing the point at which they would make their decision. All analyses were done using analysis of variance or covariance techniques.

In order to determine if the targeting decision model was applicable outside of the laboratory, a statistical analysis was done using data from a six-year period of the second Intifada. Within this Israeli-Palestinian conflict, evidence was sought of influence by target benefit and prospect frame on the sensitivity of Israeli decision makers to the cost of Palestinian civilian casualties. This analysis was restricted because only externally collectible data was available for use, so only actual attacks could be explored and not the *do-not-attack* decisions which left no externally measurable evidence. An original data set comprised of daily counts of Palestinian civilian and militant casualties was used. Also included were "high-value" Palestinians targeted and killed by the Israeli military. The primary contextual inputs for Israeli decision makers coded in the data set were the location and lethality of terror attacks by Palestinians against Israelis. The statistical analysis was done with a dynamic version of a negative binomial estimator.

Some components of the targeting decision model were intentionally not explored in this dissertation in order to focus the research and provide multiple perspectives on the aspects of the model that were selected for investigation. Three excluded aspects of this decision process are listed here. The first was issues of judgment regarding the innocence of civilians at risk of being harmed. Many would assert that innocence is a matter of judgment rather than a label of a class of individuals. In this research, civilian status was equated to innocence. A related issue involves the strategic placement of civilians in military areas and military targets in civilian areas. These practices have become increasingly common, making the application of the principles of discrimination much more difficult to apply. Finally, the process of minimizing civilian casualties also involves a search for alternatives. Variations in means, timing, and direction of strike are sometimes available to planners to provide a means of attack that better minimizes humanitarian harm. However, sometimes resource limitations, the fleeting nature of the target, or other realities force choices between otherwise undesirable options. It was these kinds of dilemmas that this dissertation particularly sought to better understand.

## FINDINGS

Each of the three factors—target benefit, civilian casualty cost, and prospect frame—affected both the targeting decision made and the evolution of that choice. Sometimes this influence was conditional. When this was the case, the conditions will be explained below as each of the major propositions is reviewed along with the associated results.

### Benefit of Target

The benefits derived from attacking the target mattered to the decision makers. In the experiments, the participants were expected to be able to determine the contribution of their assigned target toward eventual victory in the conflict and to choose more frequently to attack a high-value target than a low-value one. This was what occurred in both experiments, with significantly more support being expressed for attacking the high-value target than the low-value one regardless of the outcome dependent variable used. Target benefit also was observed in the decision process analysis as a consideration that had an immediate effect on CCP levels and maintained that effect throughout the remainder of the scenario. Because the Intifada data only included attacks that actually occurred, the associated analysis could not address the role of benefit alone. However, the high-value targets were associated with greater amounts of harm when the attack was made, as will be discussed below.

**Cost of Civilian Casualties**

The amount of humanitarian harm threatened by the attack also mattered. Experiment participants were well aware of the requirements of the law of war to minimize civilian casualties and of their government's commitment to upholding those requirements. Because of this, they were expected to show less support for an attack that was likely to result in a large number of unintended civilian deaths and more support when the expected civilian casualties were low. This was the clear result in both the first and second experiment according to each of the measures of support. When looking at the evolution of participants' choices, the introduction of the civilian casualty estimate resulted in the greatest amount of change in participant support throughout the entire scenario. Again, because the Intifada analysis did not have observations corresponding to the attacks that did not occur, it could not comment on the role of civilian casualties alone.

**Benefit and Cost**

With respect to the decision makers' sensitivity to the humanitarian cost of the attack, the amount of benefit from the target also mattered. This relationship was significant in the Intifada data analysis, but much less consistent in the experimental results. Where it occurred, the interaction between target and harm demonstrated that the dilemma between the protection of national security and the avoidance of humanitarian harm was not always resolved in the same way. It was anticipated that decision makers faced with decisions of proportionality would be more sensitive to likely humanitarian harm when the benefit offered by striking the target was low. Conversely, they were expected to be less sensitive when the anticipated benefit was great. Support was found for this proposition during the decision process in the first experiment, but not in the final choices in either experiment.[38] When the civilian casualty estimate was introduced in Experiment 1, the participants were already aware of their assigned target. Their support ratings at that point in the scenario showed a strong distinction in how the combination of target and harm estimate affected their support. If their target value was high, the number of civilian casualties mattered less in their support for the attack than when the target value was low. Because the participants in Experiment 2 were allowed to access information in the order they chose, a similar analysis was not possible in that

[38] Both outcome variables in both experiments reflected a weak trend in the expected direction.

test. However, the analysis of the Intifada data also offered support for the interaction of benefit and cost. On the days where more targeted killings of high-value Palestinians occurred, the significantly higher rates of Palestinian civilian casualties pointed to a lower sensitivity to humanitarian harm by Israeli political and military leadership.

Humanitarian norms and laws have been assumed to be the source of costs in the targeting decision model and the three tests included in this dissertation. However, as discussed in Chapter III, these costs can also arise from strategic concerns with similar results in the decision outcomes. In actuality, costs are likely calculated on the basis of both humanitarian and strategic concerns, but the results of the tests are not expected to be sensitive to this distinction.

**Frame of Prospects for Success or Failure**

The influence of prospect frame on risk attitudes was sometimes conditional and other times general in nature. The losing frame was expected to make decision makers more risk prone and thus willing to accept higher civilian casualties as a result of the attack. In both experiments, this was not the case in general but did hold in the high-stakes conditions, where both the target value and the estimate of harm were high. When confronted with this difficult tradeoff between a benefit that they strongly desired and a cost that they would much rather avoid, participants were significantly influenced by the information they had about their prospects for success or failure in the conflict. When they were losing, they showed more support for attacking the high-value target and exacting the associated high humanitarian cost than when they were winning. This pattern of decision making also occurred in the Intifada data, but as a general result that applied across all six years of the conflict that were analyzed. In this test of the targeting decision model, prospect frame was assessed in terms of the proximity of recent Palestinian terror attacks to the heartlands of Israel, and, to a lesser degree, the lethality of those attacks. Given that, Israeli leaders in a losing frame were less sensitive to humanitarian harm and more willing to accept higher civilian casualty counts.

Prospect frame was also a significant driver in how participants developed their choice in Experiment 2, the test that was specifically designed to permit the exploration of the decision process. Again, the frame was expected to affect risk attitudes, with risk-prone decision makers in the domain of loss being less concerned with information about civilian casualties and quicker to make a choice than those who were in the domain of gain and risk averse. When participants were permitted greater control over the order in which they viewed information, they accessed more target-related information early in the process than when they were in the losing frame. Additionally, when in the high-stakes conditions, a losing frame caused them to view more target- than harm-related information and less items overall, as well as to make decisions more quickly than participants in the winning frame.

## IMPLICATIONS

While these results are interesting in and of themselves, they are most important when they can be used to inform and expand existing understandings. Below, the implications of the results from this dissertation will be discussed for IR theory, for research methodology, and for policy.

## Theoretical Implications

The targeting decision model offers a promising approach to integrating prospect theory into a micro-level theoretical framework. In the tests of this model, both target benefit and civilian casualty costs worked as anticipated. The manipulation checks and some inconsistencies in the influence of prospect frame likely point to a weak manipulation of this factor in the two experiments. However, its influence in both the process and outcome of the high-stakes decisions was clearly significant. Prospect frame also offered a straightforward explanation for higher civilian casualty counts in the Intifada data. These kinds of results strengthen the evidence in favor of using prospect theory to explain decisions under conditions of risk in IR in general and in decision making in particular.

One exception in the consistency between the experimental results and the model's predictions was the behavior of decision makers in the Fool's Bet conditions, where target value was low but estimated civilian casualties were high. In these situations, the prospect frames had the opposite effect as predicted, making those participants in the losing frame *more* sensitive to humanitarian harm than those in the winning frame. This exception was likely due to the markedly disproportional comparison of benefit and cost and the reality that attacks which are clearly violations of international law bring additional costs over and above the loss of civilian lives. These unexpected results will be noted for future research using the targeting decision model.

The expectations of Cognitive Calculus also proved to be accurate in these tests, providing a new source of supporting evidence for this framework. The operation of the online decision-making process and the decision thresholds were consistent with the behavior of the experiment participants. Furthermore, this initial attempt to test prospect theory's implications within Cognitive Calculus offered better explanations for the outcome and process results than either construct would have if used separately.

Despite the fact that the scenario used in both experiments depicted a "war of choice" for the American forces, the results are expected to be transportable to other forms of interstate conflict, as well as decisions to go to war. The focus of the experiments was targeting, a ubiquitous decision process in wars of all types. More specifically, the cost-benefit tradeoff that was observed is expected to be a pressing consideration within that targeting process wherever it might occur. Furthermore, the influence of framing on this tradeoff would likely be strengthened in certain wars, especially those of national necessity, whenever the penalties of failure are likely to be particularly dire. These same factors—cost, benefit, and frame—are also expected to be key considerations in decisions to go to war. In fact, the Just War criteria for the initiation of war use ideas very similar to the jus en bello criteria of *necessity* and *proportionality*.

This model also offers possible insight into why researchers looking at civilian casualties in war have seen inconsistencies between the values a state professes and the humanitarian harm it creates. While proportionality is considered to be a straightforward comparison of benefits and costs associated with a planned attack, the targeting decision model and the test results point out that tradeoffs can also vary with prospects for success or failure. This is consistent with several of the situations that Downes (2007) concluded were likely to lead to higher civilian casualties. Another way of viewing his categories of wars of attrition, wars of long duration, or wars with high military casualties is as wartime situations in which the decision makers perceive elevated prospects of losing. Such a negative frame would make decision makers more risk accepting and thus civilian casualties more likely. In this way, prospect frame offers a means to introduce additional parsimony and explanatory power into recent and future theorizing on civilian casualties in war. Furthermore, this role of prospect frame can be extended beyond the American experience with some confidence because of the positive results from the analysis of the Intifada data.

## Implications for Methodology

Experimentation combined with the process-tracing features of Cognitive Calculus provided a rich approach to understanding better the evolution of decisions. While the multiple interim measures of CCP were somewhat obtrusive, they appear to have been well-tolerated by the participants. The post-hoc picture they provided of the decision process permitted insight into possible reasons for the inconsistencies in the frame manipulation and other nuances of participant behavior reserved for later study.

The testing of prospect frame within a moderately detailed experimental scenario was both productive and novel. Although the framing manipulation was weaker than intended, it still exerted significant influence in the interesting high-stakes conditions. As to novelty, most previous experimental research on prospect theory had either posed solitary questions with different wording (for example, Kahneman and Tversky 1979) or provided a short framing statement followed immediately by a question to determine the frame's effect (for example, Broetcher 2004; Quatrrone and Tversky 1988). Thus, this attempt to use prospect framing to establish a context against which a scenario would unfold was both innovative and useful. Also, the coding of powerful background events, such as the terror attacks in the Intifada data set, proved to be another means to capture the role of prospect framing in decision making.

The employment of a negative binomial count model in a dynamic fashion was an intuitive solution to the analysis challenge presented by the Intifada data. This approach can possibly be improved through future implementation of a method that can better account for time dependencies in the data. Two candidate approaches are the PEWMA and Poisson AR(p) models recommended by Brandt et al. (2000) and Brandt and Williams (2001).

**Policy Implications**

This research was designed to study *how* targeting decisions are made in the face of likely humanitarian harm and *why* leaders choose as they do. The study was intentionally neutral with respect to any possible legal or moral judgments of the targeting decisions made during the experiments or the second Intifada. It is arguable that the precepts of Just War and international law only set boundaries on behavior and leave much up to the discretion of the "reasonable commander" in situations such as those studied here.

The most significant insight from this dissertation for political and military leaders is that determinations of proportionality are not just exercises of logic where benefits and costs are counted and compared. As shown in this research, context intrudes on this process, making tradeoffs of the same costs and benefits deliver different outcomes depending on a decision maker's prospects for success. Both experiments showed this to be the case in the particularly vexing situations where participants were forced to choose between striking a high-value target or averting the deaths of a large number of civilians in the target area. Additionally, the Intifada analysis identified framing as regularly affecting sensitivities to humanitarian harm in real-world decision making.

According to the theoretical model, other context-related inputs may also affect choices in similar ways, but initial evidence is now available for the role of prospect framing. Given this evidence, the influence of prospects for success should be acknowledged and considered in decisions about the proportionality of attacks that threaten humanitarian harm. Whether this knowledge is used to apply some sort of correction, or merely as information, it is important for decision makers to make choices from positions of greater understanding—especially when those decisions may risk the lives of others.

NEXT STEPS

There are three directions in which this research should now move. First, improved methods are needed for improving prospect framing manipulations as context in decision making experiment scenarios. The gap should be narrowed between the weakness of the text-only manipulation of prospect frame in these experiments and the inescapable infusion of prospects in actual crises. Exploiting the ties between prospect theory and negative emotions (see Bueno de Mesquita and McDermott 2004; Geva and Skorick 2003; Sirin and Geva 2007) is one promising avenue to the desired improvement. Use of images and audio to build a more immersive experience for experiment participants, as well as reinforcement of the desired frame at multiple points during the scenario, may also be helpful approaches.

Second, there are multiple aspects of the targeting decision model yet to be investigated, both individually and in combination with each other. Two will be identified here. As mentioned earlier in this chapter, the innocence of civilians in the theater of war is not always assumed and is sometimes highly doubtful. No small part of this problem is the prevalence of insurgencies and non-uniformed combatants in today's landscape of warfare, making determinations of innocence by virtue of civilian attire a highly uncertain proposition. How the protection of civilians by international law is affected by perceptions of innocence and played out in determinations of proportionality in targeting decisions is a potentially fascinating future study. Another aspect of the model for investigation is the effect of probabilities surrounding target identification. The advent of new means of intelligence gathering offers additional resources to decision makers that can increase confidence that a target's identity is accurately characterized. Yet the age-old problems of mistakes by man and machine continue to plague the battlefield and misidentifications remain a problem. Because the initial tests of prospect theory were experiments involving gambles, it would be particularly interesting and pertinent to look at the interplay of prospect framing and varying probabilities of accurate target identification.

Third, this line of research can be generalized into public administration settings and integrated with public administration theory to explain bureaucratic decision making in settings of high risk. This could be done in two ways. The first approach would be to recognize that many of the decision makers in the targeting process are also bureaucrats subject to control mechanisms such as the DoD's top-down policy guidance, yet also possessing values of their own. This sets up interesting questions as to how the targeting decision model would interact with public administration theoretical frameworks such as principal-agent (see McCubbins, Noll, and Weingast 1989; or critique by Meier and O'Toole 2006) or those based on the inner checks of bureaucrats' values (see Rohr 1989; Cooper 1991, Frederickson 1997; Terry 2003). A second approach would be to take the targeting decision model out of the international conflict setting and apply it in domestic governmental settings that involve high-risk decision making that is likely to result in harm to innocent citizens. One example would be decisions regarding the employment of elite police teams with powerful weapons to resolve dangerous security or criminal situations in crowded urban areas. Another applicable setting would be exploration of choices as to when police will engage in high-speed chases on occupied roadways in an attempt to apprehend criminal suspects.[39]

FINAL REMARKS

Civilian casualties matter on today's battlefield perhaps more than ever before. The commander of the U.S. Air Force contingent in Afghanistan commented recently in an interview about this transformation of political and military guidance:

> *What has changed is this deeper understanding that …when the enemy [is] shooting at you from a village …instead of precisely trying to take out that enemy …you just withdraw. We have got to accept the fact that if one non-combatant is killed in this conflict, you could have 20 people pick up a rifle and fight against us as a result. So you may win the tactical battle, but you lose the overall war.* (Holmes 2009)

Given the degree of influence that civilian casualties are exerting in how democracies fight, the recent IR research into who and what generates more or less humanitarian harm on the battlefield is well timed. This dissertation has opened another branch of that research program by starting to answer questions about how and why decision makers choose sometimes to accept or reject those deaths as a necessary cost of war.

[39] This idea was shared by Dr. Ken Meier, Texas A&M University, in August 2009.

# REFERENCES


Astorino-Courtois, Allison. 2000. "Can Peace be Marketed? A Preliminary Analysis of Israelis and Palestinians." *Conflict Management and Peace Science* 18(1): 97-122.

Bennett, D. Scott. 2008. "Governments, Civilians, and the Evolution of Insurgency: Modeling the Early Dynamics of Insurgencies." *Journal of Artificial Societies and Social Simulation* 11(4). http://jasss.soc.surrey.ac.uk/11/4/7.html (Accessed September 15, 2009).

Blumenfeld, Laura. "In Israel, a Divisive Struggle over Targeted Killing." *The Washington Post*. April 27, 2006.

Boettcher, William A., III. 1995. "Context, Methods, Numbers, and Words: Prospect Theory in International Relations." *The Journal of Conflict Resolution* 39(3): 561-583.

Boettcher, William A., III. 2004. "The Prospects for Prospect Theory: An Empirical Evaluation of International Relations Applications of Framing and Loss Aversion." *Political Psychology* 25(3): 331-362.

Boettcher, William A., III and Michael D. Cobb. 2006. "Echoes of Vietnam? Casualty Framing and Public Perceptions of Success and Failure in Iraq." *Journal of Conflict Resolution* 50(6): 831-854.

Brandt, Patrick T., John T. Williams, Benjamin O. Fordham, and Brian Pollins. 2000. "Dynamic Modeling for Persistent Event-Count Time Series." *American Journal of Political Science* 44: 823-843.

Brandt, Patrick T. and John T. Williams. 2001. "A Linear Poisson Autoregressive Model: The Poisson AR(*p*) Model." *Political Methodology* 9: 164-184.

Britton, Rebecca L. and Bruce Jentleson. 1998. "Still Pretty Prudent." *Journal of Conflict Resolution* 42(4): 395-418.

B'Tselem: The Israeli Information Center for Human Rights in the Occupied Territories. 2007. "Statistics of Intifada Fatalities." http://www.btselem.org/english/Statistics/Casualties.asp (Accessed September 8, 2008).

Bueno de Mesquita, Bruce and Rose McDermott. 2004. "Crossing No Man's Land: Cooperation from the Trenches." *Political Psychology* 25(2): 271-287.

Chin, Michelle L., Jon R. Bond, and Nehemia Geva. 2000. "A Foot in the Door: An Experimental Study of PAC and Constituency Effects on Access." *Journal of Politics* 62(2): 534-549.

Chollet, Derek H. and James M. Goldgeier. 2002. "The Scholarship of Decision-Making." In, *Foreign Policy Decision-Making (Revisited)*. eds. Richard C. Snyder, H.W. Bruck, and Burton Sapin. New York: Palgrave MacMillan.

Christopher, Paul. 1994. *The Ethics of War and Peace: An Introduciton to Legal and Moral Issues*. Englewood Cliffs, NJ: Prentice-Hall.

Clarke, Harold D., David Sanders, Marianne C. Stewart, and Paul F. Whiteley. 2009. *Performance Politics and the British Voter*. Cambridge: Cambridge University Press.

Cohen, Sheldon M. 1989. *Arms and Judgment: Law, Morality, and the Conduct of War in the Twentieth Century*. Boulder, CO: Westview.

Cooper, Terry L. 1991. *An Ethic of Citizenship for Public Administration*. Englewood Cliffs, NJ: Prentice-Hall.

Crawford, Neta C. 2003. "Just War Tradition and the U.S. Counterterror War." *Perspectives on Politics* 1(1): 5-25.

Davenport, Christian. 1999. "Human Rights and the Democratic Proposition." *Journal of Conflict Resolution* 43(1): 92-116.

Davenport, Christian and David A. Armstrong II. 2004. "Democracy and the Violation of Human Rights: A Statistical Analysis from 1976 to 1996." *American Journal of Political Science* 48(3): 538-554.

Downes, Alexander B. 2006. "Desperate Times, Desperate Measures: The Causes of Civilian Victimization in War." *International Security* 30(4): 152-195.

Downes, Alexander B. 2007. "Restraint or Propellant? Democracy and Civilian Fatalities in Interstate Wars." *Journal of Conflict Resolution* 51(6): 872-904.

Eck, Kristine and Lisa Hultman. 2007. "One-Sided Violence Against Civilians in War: Insights from New Fatality Data." *Journal of Peace Research* 44(2): 233-246.

Farnham, Barbara. 1992. "Roosevelt and the Munich Crisis: Insights from Prospect Theory." *Political Psychology* 13: 205-235.

Feaver, Peter D. and Christopher Gelpi. 1999. "A Look at Casualty Aversion: How Many Deaths are Acceptable? A Surprising Answer." *The Washington Post*. November 7, 1999.

Feaver, Peter D. and Christopher Gelpi. 2004. *Choosing Your Battles: American Civil-Military Relations and the Use of Force.* Princeton, NJ: Princeton University Press.

Fenrick, W.J. 2001. "Targeting and Proportionality During the NATO Bombing Campaign Against Yugoslavia." *European Journal of International Law* 12(3): 489-502.

Fiske, Susan T. and Shelley E. Taylor. 1991. *Social Cognition*. New York: McGraw-Hill.

Ford, J. Kevin, Neal Schmitt, Susan L. Schechtman, Brian M. Hults, and Mary L. Doherty. 1989. "Process Tracing Methods: Contributions, Problems, and Neglected Research Questions." *Organizational Behavior and Human Decision Processes* 43: 75-117.

Frederickson, H. George. 1997. *The Spirit of Public Administration*. San Francisco, CA: Jossey-Baas.

Frisch, Deborah. 1993. "Reasons for Framing Effects." *Organizational Behavior and Human Decision Processes* 54: 399-429.

Gardam, Judith Gail. 1993. "Proportionality and Force in International Law." *The American Journal of International Law* 87(3): 391-413.

Gartner, Scott Sigmund. 1997. *Strategic Assessment in War.* New Haven, CT: Yale University Press.

Gartner, Scott Sigmund. 2008. "The Multiple Effects of Casualties on Public Support for War: An Experimental Approach." *American Political Science Review* 102(1): 95-106.

Gartner, Scott Sigmund and Gary M. Segura. 1998. "War, Casualties, and Public Opinion." *The Journal of Conflict Resolution* 42(3): 278-300.

Gartner, Scott Sigmund and Gary M. Segura. 2000. "Race, Casualties, and Opinion in the Vietnam War." *The Journal of Politics* 62(1): 115-146.

Gartner, Scott Sigmund, Gary M. Segura, and Bethany A. Barratt. 2004. "War Casualties, Policy Positions, and the Fate of Legislators." *Political Research Quarterly* 57(3): 467-477.

Gelpi, Christopher, Peter D. Feaver, and Jason Reifler. 2005. "Success Matters: Casualty Sensitivity and the War in Iraq." *International Security* 30(3): 7-46.

Geva, Nehemia, Allison Astorino-Courtois, and Alex Mintz. 1996. "Marketing the Peace Process in the Middle East: The Effectiveness of Thematic and Evaluative Framing in Jordan and Israel." In, *Arms Spending, Security and Development*, eds. Manas Chatterji, Jacques Fontanel, and Akira Hattori. New Delhi: Ashgate, 359-377.

Geva, Nehemia, James Mayhar, and J. Mark Skorick. 2000. "The Cognitive Calculus of Foreign Policy Decision Making." *The Journal of Conflict Resolution* 44(4): 447-471.

Geva, Nehemia and J. Mark Skorick. 2006. "The Emotional Calculus of Foreign Policy Decisions: Getting Emotions Out of the Closet." In, *Feeling Politics: Emotion in Political Information Processing*, ed. David P. Redlawski. New York: Palgrave MacMillan.

Geva, Nehemia, Steven B. Redd, and Katrina N. Mosher. 2004. "Effects of Terror and Emotions on Foreign Policy Decision Processes." Paper presented at the Annual Conference of the International Society of Political Psychologists. Lund, Sweden.

Goldgeier, James M. and Philip E. Tetlock. 2001. "Psychology and International Relations Theory." *Annual Review of Political Science* 4: 67-92.

Greene, William H. 2003. *Econometric Analysis* 5$^{th}$ Edition. Delhi: Dorling Kindersley.

Hensel, Howard M. 2008. *The Legitimate Use of Military Force.* Burlington, VT: Ashgate.

Holland, Joseph. 2004. "Military Objective and Collateral Damage: Their Relationship and Dynamics." *Yearbook of International Humanitarian Law* 7: 35-78.

Holmes, Erik. "Airstrikes Decrease Sharply in Afghanistan Despite Rise in Firefights." *The Air Force Times* September 21, 2009.

Hudson, Valerie M. 2002. "Foreign Policy Decision-Making: A Touchstone for International Relations Theory in the Twenty-First Century." In, *Foreign Policy Decision-Making (Revisited)*, eds. Richard C. Snyder, H.W. Bruck, and Burton Sapin. New York: Palgrave MacMillan.

Hudson, Valerie M. 2005. "Foreign Policy Analysis: Actor-Specific Theory and the Ground of International Relations." *Foreign Policy Analysis* 1(1): 1-30.

Jentleson, Bruce. 1992. "The Pretty Prudent Public: Post-Vietnam American Opinion on the Use of Military Force." *International Studies Quarterly* 36(1): 49-74.

Jervis, Robert. 1992. "Political Implications of Loss Aversion." *Political Psychology* 13: 187-204.

Jervis, Robert. 2004. "The Implications of Prospect Theory for Human Nature and Values." *Political Psychology* 25(2): 163-176.

Jones, Bryan D. 1994. *Reconceiving Decision-Making in Democratic Politics: Attention, Choice, and Public Policy*. Chicago: University of Chicago Press.

Jones, Steven K., Deborah Frisch, Tricia J. Yurak, and Eric Kim. 1998. "Choices and Opportunities: Another Effect of Framing on Decisions." *Journal of Behavioral Decision Making* 11: 211-226.

Kahl, Colin H. 2007. "In the Crossfire or the Crosshairs: Norms, Civilian Casualties, and U.S. Conduct in Iraq." *International Security* 32(1): 7-46.

Kahneman, D. and A. Tversky. 1979. "Prospect Theory: An Analysis of Decision Under Risk." *Econometrica* 47: 263-291.

Karol, David and Edward Miguel. 2006. "The Electoral Cost of War: Iraq Casualties and the 2004 U.S. Presidential Election." *The Journal of Politics* 69(3): 633-648.

King, Gary and Langche Zeng. 2001. "Explaining Rare Events in International Relations." *International Organization* 55: 693-715.

Kull, Steven and Clay Ramsay. 2001. "The Myth of the Reactive Public: American Attitudes on Military Fatalities in the Post-Cold War Period." In, *Public Opinion and the International Use of Force*. eds. Philip Everts and Pierangelo Isernia eds. New York: Routledge, 205-228.

Larson, Eric. 1996. *Casualties and Consensus: The Historical Role of Casualties in Domestic Support for U.S. Military Operations*. Santa Monica, CA: RAND.

Levy, Jack S. 1992a. "An Introduction to Prospect Theory." *Political Psychology* 13: 171-187.

Levy, Jack S. 1992b. "Prospect Theory and International Relations: Theoretical Applications and Analytical Problems." *Political Psychology* 13: 283-310.

Levy, Jack S. 1997. "Prospect Theory, Rational Choice, and International Relations." *International Studies Quarterly* 41(1): 87-112.

Library of Congress. 2009. "Campaign Finance: Israel." September 16. http://www.loc.gov/law/help/campaign-finance/israel.php (Accessed October 2, 2009).

Long, Scott J. and Jeremy Freese. 2005. *Regression Models for Categorical Outcomes Using Stata* 2nd edition. College Station, TX: Stata Press.

McCubbins, Mathew D., Roger D. Noll and Barry R. Weingast. 1989. "Structure and Process, Politics and Policy: Administrative Arrangements and the Political Control of Agencies." *Virginia Law Review* 75: 431-82.

McDermott, Rose. 2002. "Experimental Methods in Political Science." *Annual Review of Political Science* 5:31-61.

McDermott, Rose. 2004. "Prospect Theory in Political Science: Gains and Losses from the First Decade." *Political Psychology* 25(2): 289-312.

McDermott, Rose. 1992. "Prospect Theory in International Relations: The Iranian Hostage Rescue Mission." *Political Psychology* 13: 237-63.

Meier, Kenneth J. and Laurence J. O'Toole, Jr. 2006. *Bureaucracy in a Democratic State*. Baltimore, MD: Johns Hopkins University Press.

Miklaszewski, Jim, Courtney Kube, and Robert Windrem. 2007. "Attack that Killed Kids Targeted al-Qaida Leader." (June 19. http://www.msnbc.msn.com/id/9318805/ (Accessed August 4, 2007).

Mintz, Alex, Steven B. Redd, and Arnold Vedlitz. 2006. "Can We Generalize from Student Experiments to the Real World in Political Science, Military Affairs, and International Relations?" *Journal of Conflict Resolution* 50(5): 757-776.

MIPT (Memorial Institute for the Prevention of Terrorism). 2007. Terrorism Knowledge Base. http://www.terrorisminfo.mipt.org/incidentcalendar.asp (Accessed September 8, 2008).

Mueller, John E. 1973. *War, Presidents, and Public Opinion*. New York: John Wiley.

Orend, Brian. 2006. *The Morality of War.* Ontario: Broadview.

Page, Benjamin I. and Richard A. Brody. 1972. "Policy Voting and the Electoral Process: The Vietnam War Issue." *The American Political Science Review* 66(3): 979-995.

Quattrone, George A. and Amos Tversky. 1988. "Contrasting Rational and Psychological Analyses of Political Choice." *American Political Science Review* 82(3): 719-736.

Rengger, Nicholas. 2002. “On the Just War Tradition in the Twenty-First Century.” *International Affairs* 78(2): 353-363.

Roberts, Adam and Richard Guelff. 1989. *Documents on the Laws of War*. Oxford: Clarendon Press.

Roblyer, Dwight A. 2007. “Civilian Death from Both Sides: A Preliminary Survey of Linkages Between Terror Attacks, Airstrikes, and Collateral Casualties.” Texas A&M University. Typewritten manuscript.

Roblyer, Dwight A. 2008. “An Experimental Investigation of the Significance of Collateral Casualties in Evaluations of Foreign Policy by Civilians.” Paper presented at the Annual Convention of the International Studies Association, San Francisco, CA, March 26-29.

Rohr, John A. 1989. *Ethics for Bureaucrats* 2nd ed. New York: Marcel Dekker.

Rummel, R. J. 1995. “Democracy, Power, Genocide, and Mass Murder.” *The Journal of Conflict Resolution* 39(1): 3-26.

Schmitt, Michael N. 2002. “Law, Policy, Ethics and the Warfighter's Dilemma.” *Journal of Military Ethics* 1(2): 113-24.

Semmel Andrew K., and Dean Minix 1979. "Small Group Dynamics and Foreign Policy Decision Making: An Experimental Analysis.” In, *Psychological Models in International Politics,* ed. Lawrence S. Falkowski. Boulder, CO: Westview, 251-287.

Shafir, Eldar. 1992. “Prospect Theory and Political Analysis: A Psychological Perspective.” *Political Psychology* 13(2): 311-322.

Shanker, Thom. “A New Afghanistan Commander Rethinks How to Measure Success.” *The New York Times.* June 20, 2009.

Shaw, Martin. 2005. *The Western Way of War*. Cambridge: Polity.

Simon, Herbert A. 1977. “The Logic of Heruistic Decision-Making.” In *Models of Discovery,* eds. R. S. Cohen and M. W. Wartofsky. Boston, MA: D. Reidel.

Simon, Herbert A. 1985. “Human Nature in Politics: The Dialogue of Psychology and Political Science.” *American Political Science Review* 79: 293-304.

Sirin, Cigdem and Nehemia Geva. 2006. “Political Sophistication and Negative Emotions in Ethnic Conflicts: An Experimental Analysis.” Presented at the Annual Meeting of the International Studies Association, Chicago.

Smith, Thomas W. 2008. "Protecting Civilians…or Soldiers? Humanitarian Law and the Economy of Risk in Iraq." *International Studies Perspectives* 9(2): 144-164.

Snyder, Richard C., H. W. Bruck, and Burton Sapin. 2002. "Decision-Making as an Approach to the Study of International Politics." In, *Foreign Policy Decision-Making (Revisited)*, eds Richard C. Snyder, H.W. Bruck, and Burton Sapin. New York: Palgrave MacMillan.

Sullivan, Patricia L. 2008. "Sustaining the Fight: A Cross-Sectional Time-Series analysis of Public Support for Ongoing Military Interventions." *Conflict Management and Peace Science.* 25: 112-135.

Terry, Larry D. 2003. *Leadership of Public Bureaucracies*. Armonk, NY: M.E. Sharpe.

Tversky, Amos and Daniel Kahneman. 1981. "The Framing of Decisions and the Psychology of Choice." *Science* 211: 453-458.

Tversky, Amos and Daniel Kahneman. 1986. "Rational Choice and the Framing of Decisions." *The Journal of Business* 59(4): S251-S278.

U.S. Department of Defense. 2006. *DoD Law of War Program.*DoD Directive 2311.01E. Arlington, VA: U.S. Department of Defense.

Valentino, Benjamin, Paul Huth, and Dylan Balch-Lindsay. 2004. "'Draining the Sea': Mass Killing and Guerrilla Warfare." *International Organization* 58(Spring 2004): 375-407.

Valentino, Benjamin, Paul Huth, and Sarah Croco. 2006. "Covenants without the Sword." *World Politics* 58(April 2006): 339-77.

Voeten, Erik and Paul R. Brewer. 2006. "Public Opinion, the War in Iraq, and Presidential Accountability." *Journal of Conflict Resolution* 50(5): 809-830.

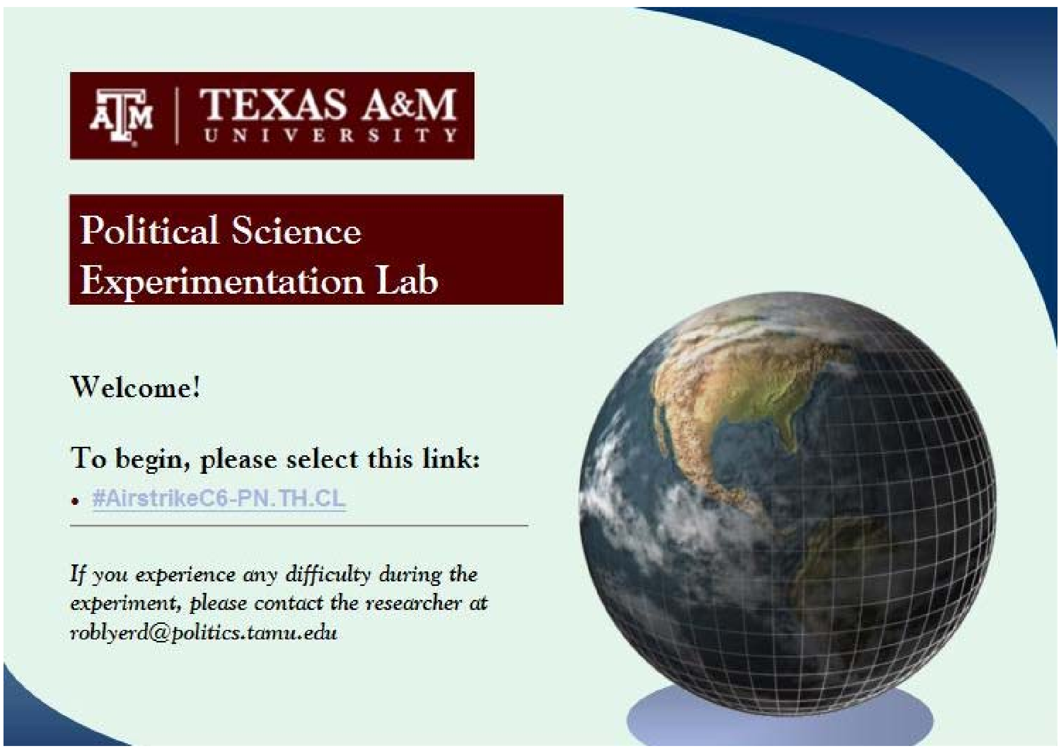
Walzer, Michael. 1977. *Just and Unjust Wars: A Moral Argument with Historical Illustrations*. New York: Basic Books.

# APPENDIX A

## EXPERIMENT 1 INSTRUMENT CONTENT

NOTE: *The following screens are taken from the first experiment, which uses a fixed order of information presentation. The second experiment, permitting variation in how information was accessed, contained the same information content.*

Welcome Screen……………………………………………………………………………




*(continued on next page)*

## Instruction Screen (1/2)……………………………………………………………………...

This experiment is seeking insight into national security decisions concerning airstrikes by U.S. military forces against enemy targets. All of your responses will be anonymous.

You will be presented with a hypothetical scenario that provides a description of a proposed military attack and its expected impacts. At the end, you will be asked to make a decision to either support or reject the proposed airstrike, given the information provided to you.

While this specific scenario is fictional, similar situations have occurred in actual military operations. Your thoughtful responses will help researchers better understand the complex deliberations concerning decisions such as those involved in these kinds of airstrikes.

As you move from screen to screen, you will be unable to return to earlier screens to view previously presented material.

Before you can advance to the next section in the scenario using the "CONTINUE" or the "MORE INFORMATION" button, most screens will require that you record your current position regarding the proposed airstrike (see picture below).

**What is your current position on the options (Attack or Not-Attack)?**
Enter **A** or **N** for your inclination at this point: [ ]
Enter a number from 1-100 for the strength of this position: [ ]

[Continue]

This is not your final decision, but your inclination at the point in time you are queried. When you are prompted, enter your current position as follows:

a) First box: enter **A** for Attack or **N** for Not-attack
b) Second box: enter a number from 1-100, where "1"=Very weak and "100"=Extremely Strong

[Continue]

## Instruction Screen (2/2, Differs for Experiment 2)……………………………………………..

Upon completion of the scenario presentation, you will be asked to choose whether or not you support the proposed attack. Please make this decision carefully. A short series of follow-up questions will then conclude the experiment.

When you select "Continue" below, the scenario will begin.

[Continue]

Scenario Screen (1/14, Introduction, Information Item 0)………………………………..

The U.S. military has been engaged in combat in the country of Nevia with local rebel forces and an international terrorist group for several years. The president of Nevia has welcomed the presence of U.S. forces in the ongoing struggle to defeat the rebel-terrorist insurgency. He also requires U.S. assistance to consolidate the very tentative position of the still-fledgling Nevian democracy. A return to rebel control would mean a return to a highly repressive autocracy in Nevia that is willing to harbor and support international terrorists. U.S. ground and air forces have been continuously engaged in combat operations to achieve this objective. At this moment, a U.S. military commander in Nevia is requesting immediate approval of an airstrike to occur in 2 hours on a target located in the northern region of the country.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point: [ ]

Enter a number from 1-100 for the strength of this position: [ ]

Continue

*(continued on next page)*

Scenario Screen (2/14, Prospect Manipulation, Information Item 1)……………………

*Either a "winning" prospect:*

**Information:**

American forces have clear superiority in firepower, and are considered to be close to defeating this stubborn insurgency. The logistical supply line between the terrorists and the rebels seems to have been broken, with the rebels able to mount only weak offensives in the past several months. Nevian and U.S. forces continue to consolidate territorial holdings and popular support around all of the major regional centers. U.S. military casualties have been sharply reduced, with a lower casualty count over the past 6 months than during any similar period since the start of the conflict.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*...or a "not winning" prospect:*

**Information:**

American forces have clear superiority in firepower, but are not considered to be close to defeating this stubborn insurgency. Terrorists have stepped up training and supplies for the rebels, who have launched multiple offensives in the past several months. The ferocity of these rebel attacks has caused the Nevian forces to cede major regional centers back to the rebels, completely reversing progress made over the preceding 36 months. U.S. military casualties continue to mount steadily, with the casualty count higher over the past 6 months than during any similar period since the start of the conflict.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*(continued on next page)*

Scenario Screen (3/14, Target Manipulation, Information Item 2)……………………..

*Either the "high-value" target:*

**Information:**

Intelligence analysts have provided an assessment of "very-high confidence" that the deputy commanders of both the rebel forces and its sponsoring terrorist organization will be meeting to discuss ongoing and future operations within all the regions of Nevia. The meeting will take place in building in a medium-sized village.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*…or the "moderate-value" target:*

**Information:**

Intelligence analysts have provided an assessment of "very-high confidence" that a low-level rebel commander will be meeting with a terrorist organization operative to discuss ongoing and future operations within that single region of Nevia. The meeting will take place in building in a medium-sized village.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*(continued on next page)*

## Scenario Screen (4/14, Target Information, Information Item 3)……………………….

*For the "high-value" target*:

**Information:**

A successful attack is expected to disrupt insurgency operations across all of Nevia.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*...or for the "moderate-value" target:*

**Information:**

A successful attack is expected to disrupt insurgency operations within one region of Nevia.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

## Scenario Screen (5/14, Target Information, Information Item 4)……………………….

**Information:**

A medium-size precision-guided bomb will be used for the strike, giving an 80-percent likelihood of killing both individuals.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

Scenario Screen (6/14, Target Information, Information Item 5)………………………….

**Information:**

Recent intelligence of this type has been reliable.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

Scenario Screen (7/14, Target Information, Information Item 6)………………………….

**Information:**

International law permits military forces to attack enemy military targets, including personnel and equipment.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

Scenario Screen (8/14, Target Information, Information Item 7)………………………….

**Information:**

Military legal experts have provided assurances that this target is legal under international law.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*(continued on next page)*

Scenario Screen (9/14, Civilian Casualty Manipulation, Information Item 8)…………..

*Either the "high" level of casualties:*

**Information:**

It is likely that this airstrike will kill or critically injure 30 Nevian villagers, some of whom will be women and children. The targeted building is situated among a cluster of smaller, mud dwellings that offer very little protection to their inhabitants. This civilian casualty estimate is higher than all previous civilian casualty tolls from air and ground strikes during the past 3 months. The previous high count had been 26 civilians killed.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*…or the "low" level of casualties:*

**Information:**

It is likely that this airstrike will kill or critically injure 5 Nevian villagers, some of whom will probably be women and children. The targeted building is situated among a cluster of smaller, mud dwellings that offer very little protection to their inhabitants. This civilian casualty estimate is lower than most civilian casualty tolls from previous air and ground strikes during the past 3 months.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*(continued on next page)*

Scenario Screen (10/14, Civilian Casualty Information, Information Item 9)…………..

*For the "high" level of casualties:*

**Information:**

Estimates show an 80-percent likelihood of these 30 civilian casualties resulting from this strike. Because the meeting is expected to take place during daytime hours on a local holiday, numerous villagers are expected to be in the area that will be impacted by the bomb blast.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

*...or for the "low" level of casualties:*

**Information:**

Estimates show an 80-percent likelihood of these 5 civilian casualties resulting from the strike. Because the meeting is expected to take place during daytime hours on a normal workday, only a few villagers are expected to be in the area that will be impacted by the bomb blast.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

Scenario Screen (11/14, Civilian Casualty Information, Information Item 10)………..

**Information:**

No other attack options exist within this short time window to strike the intended target with a strong chance of success while also reducing the risk to innocent civilians.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

Scenario Screen (12/14, Civilian Casualty Information, Information Item 11)…………

**Information:**

Previous civilian casualty estimates for airstrikes of this type have been reliable.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

Scenario Screen (13/14, Civilian Casualty Information, Information Item 12)…………

**Information:**

International law recognizes that unintentional harm to civilians may sometimes be necessary when militaries are attacking enemy military targets. In these cases, militaries must weigh the expected human loss against the military advantage of attacking the target. The attack should only proceed if the risk to civilians cannot be further reduced and the expected benefit is greater than the imposed cost.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

Scenario Screen (14/14, Civilian Casualty Information, Information Item 13)…………...

**Information Source: Civilian Casualty Information**

Military legal experts have provided assurances that this target is legal under international law.

**What is your current position on the options (Attack or Not-Attack)?**

Enter **A** or **N** for your inclination at this point:

Enter a number from 1-100 for the strength of this position:

More Information

Final Decision Screen……………………………………………………………………………

**Information:**

There is no additional information about the case. Please make your decision now.

Yes, the U.S. should launch the airstrike

No, the U.S. should not launch the airstrike

Questionnaire Instruction Screen…………………………………………………………

## Airstrike Post-Scenario Questionnaire :

### Instructions

Based on the information presented in the scenario you just completed, please select your best answer for each of the questions that follow. Please carefully answer all of the questions--this activity will take less than 3 minutes of your time.

If you select "NEXT>>" at the bottom of a screen without registering an answer on each item, you will be prompted to do so before you are permitted to proceed.

NEXT >>

*(continued on next page)*

Questionnaire Screen (1/3)……………………………………………………………

**1. RECALL THE DECISION YOU JUST MARKED REGARDING YOUR SUPPORT FOR THE ATTACK. HOW CERTAIN WERE YOU ABOUT THAT CHOICE?** *SELECT THE NUMBER THAT BEST DESCRIBES YOUR ANSWER.*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Very Uncertain | . | . | . | . | . | . | . | . | Extremely Certain |

**2. HOW DIFFICULT WAS THAT DECISION TO SUPPORT OR NOT SUPPORT THE ATTACK?** *SELECT THE NUMBER THAT BEST DESCRIBES YOUR ANSWER.*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Very Easy | . | . | . | . | . | . | . | . | Extremely Difficult |

**3. IN THE SCENARIO, WHAT WAS THE STATE OF PROGRESS BY AMERICAN FORCES IN THIS CONFLICT?**

| Winning | Stalemate | Losing | Unknown |
|---|---|---|---|

**NEXT >>**

Questionnaire Screen (2/3)……………………………………………………………

**4. WHAT WAS THE INTENDED TARGET OF THE ATTACK?**

| Cache of militant supplies and equipment | Low-level rebel and terrorist leaders | Deputy commanders of the rebel and terrorist groups | Militant forces | Don't know |
|---|---|---|---|---|

**5. WHAT WAS YOUR ASSESSMENT OF THE IMPORTANCE OF THIS TARGET TOWARD WINNING THE WAR?**

| Not important at all | Mildly important | Moderately important | Quite important | Extremely important |
|---|---|---|---|---|

**6. WHAT WAS THE SCENARIO'S ESTIMATED PROBABILITY OF A SUCCESSFUL ATTACK AGAINST THE TARGET?**
*(ENTER A NUMBER IN THE RANGE OF 0 TO 100)*

**NEXT >>**

Questionnaire Screen (3/3)……………………………………………………………

**7. WHAT WAS THE NUMBER OF NEVIAN CIVILIANS AT RISK OF BEING HARMED BY THE ATTACK?**
*(ENTER A NUMBER IN THE RANGE OF 0 TO 100)*

**8. WHAT WAS THE SCENARIO'S ESTIMATED PROBABILITY OF CIVILIANS BEING KILLED BY THE ATTACK?**
*(ENTER A NUMBER IN THE RANGE OF 0 TO 100)*

**9. HOW WOULD YOU CHARACTERIZE THE EXPECTED COST IN CIVILIAN CASUALTIES WHEN COMPARED TO THE PROPOSED TARGET?**
*SELECT THE NUMBER THAT BEST DESCRIBES YOUR ANSWER.*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Cost was negligible | . | . | . | . | . | . | . | . | Cost was too high |

**10. WITH WHICH SCHOOL ARE YOU ASSOCIATED?**

AWC ACSC SOS TAMU Other

NEXT >>

# APPENDIX B

# REGRESSION RESULTS FOR EXPERIMENTS 1 AND 2

## LOGIT Results for ATTACK in Experiment 1

| Variable | Odds Ratio | Coefficient | Z | p |
|---|---|---|---|---|
| FRAME | .671 | -.400 | -1.27 | .103 |
| TARGET * | 1.960 | .673 | 2.10 | .018 |
| HARM ** | .460 | -.777 | -2.41 | .008 |
| Constant ** | --- | .866 | 2.75 | .003 |

* $p < .05$ ** $p < .01$
Where variables are dichotomous: ATTACK (0 = Do Not Attack and 1 = Attack); FRAME (0 = Losing and 1 = Winning); TARGET (0 = Low Value and 1 = High Value); and HARM (0 = Low Harm and 1 = High Harm)

## LOGIT Results for ATTACK in Experiment 2

| Variable | Odds Ratio | Coefficient | Z | p |
|---|---|---|---|---|
| FRAME | .928 | -.075 | -.19 | .423 |
| TARGET *** | 6.816 | 1.919 | 4.75 | .000 |
| HARM * | .432 | -.840 | -2.18 | .015 |
| CCP-0 *** | 1.011 | .011 | 3.78 | .000 |
| Constant | --- | .002 | .01 | .498 |

* $p < .05$ *** $p < .001$
Where variables except CCP-0 are dichotomous: ATTACK (0 = Do Not Attack and 1 = Attack); FRAME (0 = Losing and 1 = Winning); TARGET (0 = Low Value and 1 = High Value); and HARM (0 = Low Harm and 1 = High Harm)

# VITA

| | |
|---|---|
| Name: | Dwight Andrew Roblyer<br>Colonel, United States Air Force |
| Address: | Air War College<br>Department of International Security Studies<br>325 Chennault Circle<br>Maxwell AFB, AL 36112 |
| Email Address: | dwight.roblyer@gmail.com |
| Education: | B.A., Physics, Texas A&M University, 1984<br>M.S., Space Operations, Air Force Institute of Technology, 1992<br>Ph.D., Political Science, Texas A&M University, 2009 |