PROSPECT THEORY IN INTERNATIONAL RELATIONS

Ozzie Chung

Abstract

Prospect theory, a behavioral economic theory first proposed by David Kahneman and Amos Tversky in 1979, has evolved into a seminal theory on risk decision-making applicable in a wide range of fields. Yet in both political science and international relations, prospect theory remains controversial, in part due to its laboratory origins as an economic theory. This study seeks to examine prospect theory's explanatory power in 78 cases of interstate conflict. Through a bivariate logistic regression of risk determinants leading up to interstate conflict, the study determines that prospect theory does not have significant explanatory power as a predictor of war outcomes and has limited usage as a broad overarching theory in international relations.

Introduction

Since David Kahneman and Amos Tversky (1979) published their seminal paper, "Prospect Theory: An Analysis of Decision under Risk", on risk behavior and decision-making, a plethora of research has arisen across multiple disciplines. These disciplines include psychology and economics, fields which the authors worked in, but also mathematics, law, health, sociology, statistics, and engineering. As an alternative theory to the expected-utility hypothesis, which in international relations forms the backbone of Realist and Liberal scholarship, prospect theory argues that individuals make decisions based on their perception of losses and gains, not the final outcome. Yet of the robust

OZZIE CHUNG is a student of International Relations specializing in U.S.-China Relations.
School of International Service, American University
Email: oc7520a@student.american.edu

Clocks & Clouds: Journal of National and Global Affairs, 2013, 4:2, (21-37)
<http://www.american.edu/clocksandclouds/>
HBP Publishing <http//www.hbp.com/>

literature deriving from Kahneman and Tversky's work, studies conducted in an international relations context represented only a small percentage of resulting literature (Mercer 2005, 2). An early scholar of prospect theory in international affairs later posited this was because "attempts to test these hypotheses in the complex arena of world politics faced serious conceptual and methodological problems" (Levy 1997, 88).

Consistent with this belief, many initial studies (Jervis 1992, Boettcher 1995, Shafir 1992, Levy 1992) rarely strayed outside the interdisciplinary application of prospect theory, instead choosing to focus on testing the new environment in which the theory would be transposed. These articles, which occurred in rapid succession during the early 1990's and 2000's, concluded that prospect theory had descriptive and explanatory power, yet contained significant areas for improvement and clarification.

Over the past decade, many studies have begun to test prospect theory's analytical capabilities in various case studies of high-risk situations in international politics (Schaub 2004, He and Feng 2009, Haas 2002, Hancock and Weiss 2011, He and Feng 2012). However, there exists a gap between the initial studies of prospect theory in international relations, and the subsequent applications of prospect theory to individual case studies. Conclusions of prospect theory's utility have been mixed, likely due to the lack of an underlying theoretical framework for testing in a social context.

As a result, building upon and expanding existing research on prospect theory represents a substantive goal that would advance the current state of prospect theory discourse in international relations. What is prospect theory's explanatory power in international relations? This question will form the basis for this study's contributions to scholarly literature. This paper aims to discern a better understanding of the theoretical and methodological difficulties facing prospect theory in IR, as well as its legitimacy as a decision-making model in the international sphere.

Theoretical Foundation

Prospect theory originated as an alternative model to the expected-utility principle, a theory that dates back to the Enlightenment era. Also known as the rational choice theory, the utility principle asserts that actors will behave rationally by estimating the expected value of his or her options. The expected value function, determined by the sum of a choice's costs and benefits in relation to its probability ([costs + benefits] x [probability]) [1], orders each

possible option for the actor to then choose based on highest expected value (Schaub 2004). In other words, actors attempt to maximize the expected utility in their choices by selecting the choice with the highest return (Luce and Laiffa 1989, Ch. 2).

The expected-utility principle, though reflective of human appreciation for rationality, fails to account for changes in perception and the context of individual risk situations. Indeed, in terms of the rational choice theory such decisions would be called irrational. In his initial foray into behavioral psychology in international relations, Levy (1992) provides an example of how irrational behavior can appear rational:

> In a typical experiment, 80% of respondents preferred a certain outcome of $3,000 to an 80% chance of $4,000 and 20% chance of nothing. If faced with the same two negative prospects, however, 92% of respondents preferred to gamble on an 80% chance of losing $4,000 and 20% of losing nothing to a certain loss of $3,000. In both cases respondents chose the option with the lower expected value and the combination of these two patterns is inconsistent with expected-utility theory. (174)

As exemplified, participants in the experiment chose the option contrary to the rational choice model. Cases such as these formed the foundation for alternative theories of decision-making under risk situations.

Over the past three decades prospect theory has risen to become the leading alternative to the expected-utility model (Levy 1996). Instead of the linear relation between probability and expected utility according to the rational choice model, prospect theory depicts an S-shape function oriented around a reference point (Levy 1992). The reference point changes as decisions are made and gains and losses are calculated. Because most individuals frame decisions around these gains and losses, the reference point is important because it divides a decision into two realms: a domain of gains for decisions which results in relative gain, and a domain of losses for decisions which results in relative loss. Determining the location of the reference point remains one of the most challenging aspects of applying prospect theory to the study of

1 Costs and benefits are multiplied independently if the probability of costs and benefits are different.

international crises today.

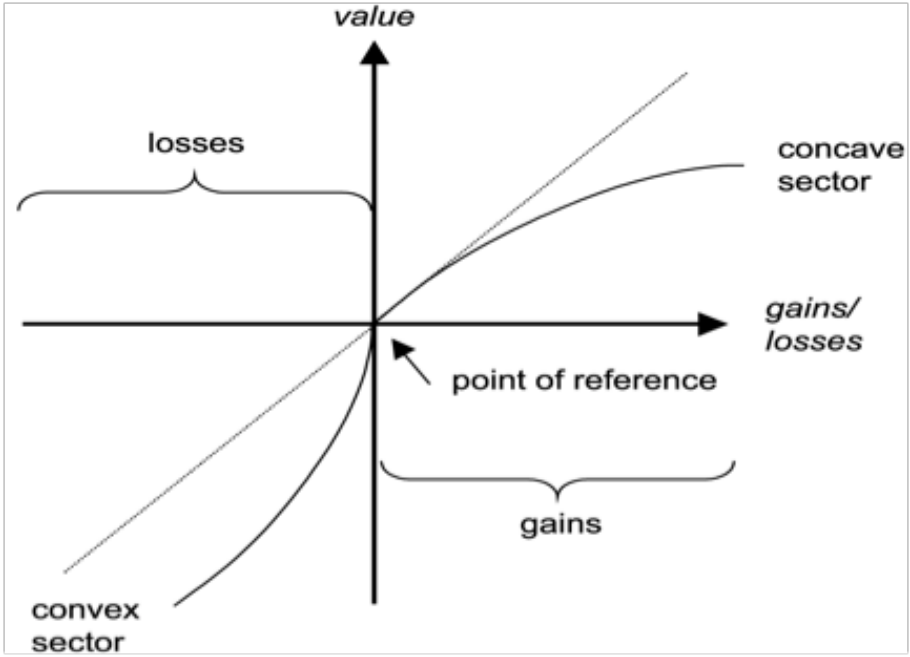

Figure 1. Value Function of a Prospect Theory Model. Source: Jacob and Ehret 2006

As depicted in Figure 1, Kahneman and Tversky (1979) determined through multiple laboratory experiments that decision-making occurs in the context of a framing effect that places particular weight on decisions occurring within the domain of losses. Several conclusions can be determined from Kahneman and Tversky's experiments:

1. People tend to think in terms of gains and losses.

2. People tend to be risk-averse (less risky in decision-making) with respect to gains, and risk-acceptant (more risky in decision-making) with respect to losses.

3. Increasing trends in gains and losses results in diminishing values on both sides of the point of reference. As one moves further from the reference point, the sensitivity to increments of change decreases equally for both the domain of gains and the domain of losses.

4. The endowment effect: Actors tend to overvalue their current possessions

5. Individuals overweigh outcomes which are certain compared to outcomes which are merely probable.

6. Individuals overweigh differences compared to similarities, and tend to ignore similarities. (Levy 1992)

Though these conclusions are broad in that they do not specifically refer to actors in an international context, defining prospect theory and its conclusions is important to understanding how scholars have transposed the framework of prospect theory from the laboratory to international relations. Further explanation of the logical progression from theory to conclusion will be discussed in the methodology section.

Literature Review

In international relations, research on prospect theory can be divided into two categories: scholars in Group A that studied prospect theory in an interdisciplinary context, and scholars in Group B that have applied the conclusions of the former to specific case studies in international relations.

Group A Scholars

At the forefront of research into prospect theory, scholars in Group A have studied the theoretical and mathematical explanations for prospect theory and extrapolated them to an international context. Among the first and most referenced articles published included those by Levy (1992), Boettcher(1995), and their follow-up works.

Levy (1992) identifies two phases of prospect theory as an alternative theory of risky choice. The editing phase includes a preliminary analysis of the options available to the actor, including possible outcomes and consequences and their associated values and probabilities (179). In the editing phase, the options are broken down to "simplify subsequent evaluation and choice" (Tversky and Kahneman 1981, 453). The evaluation phase examines the edited options and selects the preferred prospect (Levy 1992, 180). Though the editing phase contains a rigorous mathematical model used to evaluate an actor's options, the evaluation phase lacks a solid theory of framing and editing. Levy notes that the ambiguity of determining a framework through the "norms, habits, and expectancies of the decision maker" is especially troublesome given the complex nature of the international environment (Ibid.).

Boettcher (1995, 577) builds upon these deductions by concluding that prospect theory is first and foremost a "descriptive theory" with no power to independently create a frame for risk situations. He identifies the "form of the probabilistic expression to a decision maker" as an important control variable in future studies, and advises researchers to "take care in applying formal, mathematically represented models of choice" (588). Like Levy, Boettcher also highlights the difficulties of applying prospect theory to the context of foreign policy decision making.

In a subsequent review of his 1992 paper, Levy (1997) identifies several additional problems with prospect theory. First, he notes that "none of the alternatives to expected utility theory…consistently organize the data" (197). Without a stringent methodological model for carrying out the evaluation phase of prospect theory, it becomes difficult to compare aggregated studies of similar situations. Additionally, problems lie within the external framework. In international relations, it is difficult to compare the "riskiness" of several options related to a decision. Defining risk in both the domain of gains and the domain of losses remains an issue which again makes comparisons difficult.

As a complementary article Jervis (1992) also brings up the issue that, as opposed to the singular actor in experiments, risk situations in international relations have two actors, and therefore the problems of identifying a reference point are compounded (197). He then argues that aggregation remains a problem. Specifically, whether or not the assumption that tests performed on a single actor can be extrapolated to a group, state, or organization remains an issue.

Though these early authors identify several major issues in prospect theory, they are keen to remind future scholars that their criticism serves to refine and improve a theory which has promise as an alternative theory to risk decision-making. Levy (1997) states that "regardless of outcome, prospect theory and its associated experimental findings have already made a significant set of contributions to the international relations literature…" (108). The potential of prospect theory and the importance of further research in producing more explanatory and less contradictory results goes hand in hand.

In the past decade, though there have been fewer articles examining the applicability of prospect theory in international relations, two recent articles of note fall under the category of Group A. In an assessment of prospect theory in political science, Mercer (2005) addresses the issue of determining a reference point by introducing five factors: status quo, aspiration, heuristics, analogies, and emotion. In similar fashion, Vis (2011) determines that the issue

of aggregation had only a marginal effect on international relations. Though these articles represent attempts to address outstanding issues in the ongoing dissection of prospect theory in international relations, such research has yet to be consolidated or widely disseminated.

Group B Scholars

Whereas the research of Group A Scholars has been centered around discussions within the same circles, namely in the journal Political Psychology, Group B scholars have published papers that are much more widely dispersed and cover a broader cross-section of international affairs. Most notably, these scholars have applied the theoretical analyses of Group A scholars to a spectrum of international skirmishes, conflicts, and wars. Hancock and Weiss (2011) applied prospect theory to investigative the politically risk-laden atmosphere surrounding the Oslo Accords, for example, while Haas (2002) sought to better explain the decision-making processes of top players in the Cuban Missile Crisis. Other authors utilized prospect theory in conjunction with other theories to examine alliances and other strategic functions. In two separate studies, Schaub (2004) and Lupovici (2010) employed prospect theory as a supplementary tool to examine deterrence theory, while Butler (2007) attempted to apply a prospect-theoretic explanatory model to coercive bargaining. He and Feng (2012, 2009) incorporated prospect theory in both a case study on tensions in cross-strait relations between China and Taiwan and a balance-of-threat analysis of alliance strategies in Asia.

Through this varied selection of prospect theory's application in international crises, it can be said that prospect theory is not lacking in either the number of scholars willing to integrate it in their research, or in the number of opportunities for its use. However, though there has been plenty of literature, many of the articles examined fail to account for all the variables brought up in Group A.

Some studies, like those of Hancock and Weiss (2011) and Haas (2002), choose reference points based on their own framework of qualitative methods. This is a subjective form of analysis that, when used in varying capacities over a broad scope of literature, creates as much difficulties in comparing methods as it does interpreting them. Other scholars seek to circumvent the issue entirely by predetermining a reference point (Schaub 2004). Such studies often incorporate prospect theory for its descriptive power – such as deterrence theory – but fall short elsewhere.

Among the scholars that have attempted to determine inputs for a model of determining frames of reference, Butler (2007) notably diverges

from the norm by introducing a mathematical model for determining a reference point, identifying power distribution, equity, variants of the status quo, and aspirations. This mathematical model is relatively new and has yet to be rigorously tested. Similarly, Mercer (2005) introduced his own set of determinants which have seen moderate use in literature (He and Feng 2009, Holmes 2012). By and large, however, the majority of research done in the field of international relations has not coalesced around a single theoretical framework for testing and setting a frame of reference.

Part of this stark contrast in empirical data is because Group A scholars (those testing the theory itself) had long concluded that prospect theory was greatly hindered by its laboratory origins in explaining individual decision-making (Levy 1997, Boettcher 1995, Levy 2003, Tversky and Kahneman 1981). Yet recent literature has illuminated the substantial body of experimental and empirical evidence – drawn from a variety of sub-disciplines unassociated with political science – which implies the opposite (Vis 2011, 338, Renshon 2013). Kühberger's (1998) meta-analysis of 248 published experiments involving risk decision-making, for example, supports the assumption that prospect theory can be applied equally well at the collective level.

Drawing upon Vis' and Kühberger's progressive work, this research proposal attempts to broaden the definition of prospect theory while addressing the framing and reference point issues which plague both qualitative and quantitative methodologies. At the same time, this paper will seek to expand existing literature on prospect theory through a macro, quantitative perspective. Keeping in mind that any development of a procedure to identify reference points "must be independent of the behavior to be explained in order to avoid the circularity of inferring an actor's reference point from her behavior and then explaining that same behavior in terms of framing effects based on that reference point" (Levy 2003, 234), this paper seeks to apply Kahneman's seminal theory on risk decision-making to the analysis of international crises.

Methodology

To carry out the research proposal, this study hypothesizes that states that increasingly perceive themselves to be in a domain of gains will exhibit risk-averse behavior and trend towards winning the wars they initiate, while states that increasingly see themselves in a domain of losses will display risk-seeking behavior and trend towards losing the wars they initiate. In other words, states that feel they are winning will be less likely to take risks and be more likely to consolidate their gains and win the wars they initiate. On the other hand,

states that feel they are losing will be more willing to take risks which would cause them to lose wars. This hypothesis assumes that the perception of loss and gain may not reflect the actual situation, and that making risky decisions in international crises generally backfires on the instigating actor.

States in a domain of gains or domain of losses will be the independent variable (IV) and outcome of war will be the dependent variable (DV). Because war tends to be the worst-case scenario for all actors, it likely is also the most risky of options. Prospect theory is therefore particularly useful in assessing the outcome of such risk. The proposal will be conducted through a bivariate analysis to test the explanatory power of prospect theory at a surface level. Because prospect theory has yet to be explored through quantitative means, the following research analysis will create a framework for future scholars to build their research.

Independent Variable

As the DV, domain – regardless of loss or gain – refers to whether an action takes place in the perceived realm of gains or losses; it can be relatively objective or subjective (McDermott 1998, 37). Extrapolated to the international stage, domain refers to a sense of whether a state perceives itself to be acting from a position of gains or losses.

To properly account for the subjective natures of individual actors or governments, McDermott argues that "an analyst needs to distinguish among the various criteria that different actors may use to determine perceived domains of action" (1998, 38). Due to limitations of time, defining domain on a case-by-case scenario is impossible in a quantitative study, though it remains a common method in most qualitative research. As a result, the next best alternative would be to borrow a set of quantitative guidelines from a similar study examining similar variables to determine the factors of domain.

A recent study by Jonathan Renshon (2013), "Status Deficits and War", contains a data set which takes an unconventional approach to determining the causes of war by examining status as its independent variable. Renshon argues that the states with larger status deficits are more likely to take risks and enter wars. The central innovation in Renshon's research is the use of Google's PageRank algorithm, listed in Figure 2., to determine a state's status deficit:

$$PRA=1- d + dPRT1CT1 + \cdots + PRTnC(Tn)$$

Figure 2. Google PageRank Algorithm. Source: Sobek 2003

Where *PRA* is the PageRank of page *A*, *PRTi* is the PageRank of pages

Ti which link to page *A*, *CTi* is the number of outbound links on page *Ti* and *d* is a damping factor which can be set between 0 and 1 (Renshon 2013). The damping factor, which accounts for the chance that a random user will stop clicking out of boredom, has little impact on the final result and can therefore be excluded (Renshon 2013).

The PageRank algorithm is particularly important here, as it helps account not only for the sending of diplomats but also for the reception of other states' diplomats based on the importance of each country's diplomatic ties (Renshon 2013, 18). The contradiction here – that a state's status rank is based on the status ranks of its relations – is addressed by setting the status ranks of all countries in a given year to "1".

The PageRank algorithm can be used to determine a state's Status Rank, which is then subtracted from the state's Power Rank in a given year to determine the final Status Deficit of a state. Calculations of the Power Rank will be gathered based on each country's CINC (composite index of material capabilities) score obtained at the Correlates of War site. Data from the Status Rank, on the other hand, will be drawn from the Correlate of War's "Diplomatic Exchange" dataset.

The values for Status Deficit is then divided and categorized by standard deviation below the mean (SDBM). SDBM therefore becomes the operationalized value for the independent variable. As a strong indicator of a state's perspective prior to conflict, SDBM will be used to determine the reference point of a state prior to war. The use of SDBM as a reference point is unique to this research and provides yet another possible solution to understanding a state's perspective prior to its decision-making.

Because the independent variable in Renshon's article and the hypothesis are closely related and can be interchanged, Status Deficits represents the most ideal variable to determining a reference point and to establishing a domain of gains and losses. Additionally, whereas indigenous definitions of domain would undoubtedly lack in methodological rigor, relying on existing research conducted at a higher level of quantitative analysis would greatly benefit the findings of this study. Based on a comparison of sequential years, a state's status deficit will determine its mindset going into a war, which will then be combined with the independent variable discussed below, to determine whether states in a domain of gains and losses act as prospect theory dictates. To remove any possibilities of feedback from the dependent variable back to the independent variable, the years in which each variable is compared will be staggered, $t - 1$ for the independent variable, status deficits, and t for the dependent variable, outcome of war.

Dependent Variable

To operationalize risk behavior, the independent variable needs to be both quantifiable and demonstrative of a high-risk situation. As a result, the outcome of wars is a logical choice. History shows that even well prepared and confident initiating states can end up losing a war. (Merom 2003) The usage of outcome of wars as the development variable helps to assess why some states win and others lose.

Due to the constraints of the dependent variable, operating on a nominal (0=lose war, 1=win war) scale for wars is the most realistic option. Using a directed-dyadic dataset drawn from the Correlates of War (COW) Inter-State War Data (v4.0) (2007), only the outcomes of "0" and "1" will be gathered. This is due to a lack of time to critically examine interstate wars which either become intrastate wars or fall below the threshold levels of war.

Should the hypothesis lean toward causality, states exhibiting a greater standard deviation below the mean (an indicator of status deficit and distance from the reference point) will be less likely to win wars they initiate, and states exhibiting a greater standard deviation above the mean will be more likely the win the wars they initiate.

Control Variable

Because a country's demographics, economic power, and military strength may all contribute to a state's perception of its status, I used the Composite Index of National Capability (CINC score) found on the Correlates of War site and calculated the ratio of the CINC score of the defender over the CINC score of the initiator. This continuous variable was then inputted in the bivariate logistic regression to determine its influence and effect on both the DV and IV.

Data Analysis

Outcome	Coeff.	Std. Err.	z	P>z
SDBM	-6.528278	8.712593	-0.75	0.454
_cons	.1570533	.4684336	0.34	0.737

Figure 3. Bivariate Logistic Regression Test (without CINC score)

Clearly, in Figure 3 the relationship between the independent variable, status deficits (calculated by standard deviation below the mean (SDBM)), has

no statistical relation to the dependent variable, the outcome of war. At 0.454, the p level indicator for causality does not fall under the 0.05 significance level for statistical correlation. This suggests that, assuming no relation between the state perceptions of status and the outcome of wars, there is a 45.4% probability that the data was obtained out of chance. Through the -6.53 seen in the coefficient, however, there is possible indication of a negative relationship between a state's distance from the mean and its likelihood of winning a war.

Outcome	Dy/dx	Coeff.	Std. Err.	z	P>z
SDBM	-1.846338	-7.414716	8.894489	-0.83	0.404
CINC Ratio	-.0050917	-.0204477	.0391593	-0.52	0.602
_cons		.2459278	.4979753	0.49	0.621

Figure 4. Bivariate Logistic Regression Test (without CINC score)

The same logistic regression with CINC score calculated does not significantly change the results. The control variable has little impact on a state's likelihood of winning a war. Though there is a lower p-value, and thus reduced likelihood that the IV and DV occur by chance, it does not change the outcome of the results in a substantial way. The predicted probability (dy/dx) column indicates that per every 1.0 increase in value of the standard deviation below the mean (SDBM), it is 1.8% less likely that a state wins a war, which further corroborates but does not alter the initial test calculated in Figure 3. This can also be seen in the regression chart in Figure 5:

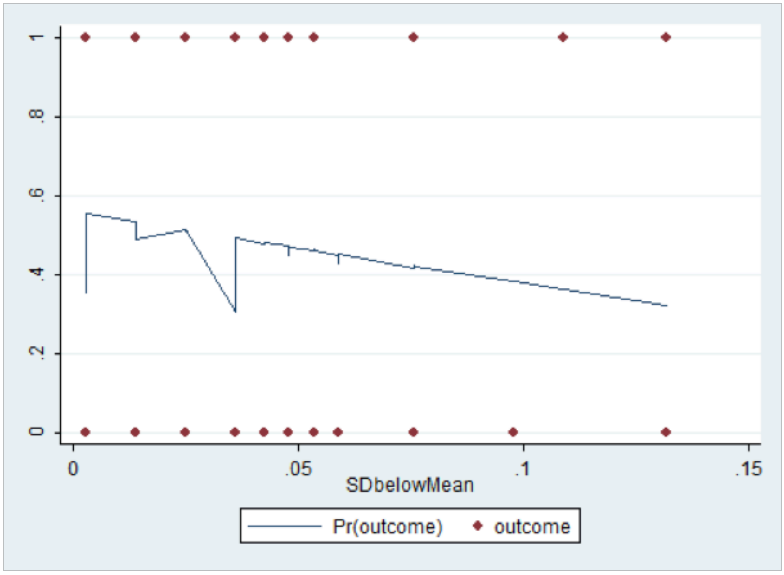

Figure 5. Bivariate Logistic Regression Test (without CINC score)

Whereas a test depicting strong correlation would have cases aggregated in the upper right and bottom left corner of the screen, variations in standard deviation do not appear to have any significant impact on the distribution of cases. Additionally, the graphed prediction line depicts a weak negative correlation between status deficits (calculated in standard deviations below the mean) and the outcome of war. From Figures 3, 4, and 5, the dependent variable is shown to have no correlation to the independent variable. Because status deficits demonstrate a state's domain of gains or losses, this study concludes that a state's distance from the reference point – defined as status deficits and calculated by standard deviations – does not affect the outcome of wars it initiates.

Conclusion

The research conducted in this paper reflects the difficulty in applying prospect theory to the social sciences. Using a new approach in status deficits to define the reference point, this study sought to provide insight on not only the applicability of alternative measures of reference-determining variables but also to examine prospect theory using quantitative means. Given the limited time and resources available, the author was unable to come to a

more definitive conclusion about prospect theory's explanatory power in international relations. Though the results suggest that there is no correlation between status deficits and the outcome of wars, when studied at the theoretical level the outcome only limits the applicability of prospect theory to the specific methodology listed in this paper. Specifically, the research conducted here has two implications: a) that a state's perception of status does not affect the outcome of wars it initiates, and b) that status deficits as the determinant to defining a reference point has little individual explanatory power.

The first implication suggests that status deficits are not significant in determining the outcome of war. This echoes the trend Lindley and Schildkraut (2005) argue for – that states' perceptions of themselves and of their opponents fall victim to miscalculation and misperception. Based on their conclusions, determinants of war are becoming "increasingly elusive… [and] more study of miscalculation and misperception" is called for (43). Though the CINC score included in the data analysis accounted for traditional determinants in demography, military power, and economic power, a whole host of other factors could impact a state's perception of its status going into a war: relative power of neighbors, the pain-tolerance of defenders, variations in transparency as indicators of informational accuracy, the frequency for change in a state, etcetera. Future research, however, can take into consideration the negative relation between status deficits and war outcomes when researching factors leading up to and determining wars.

The second implication suggests that while status deficits do not support the irrationality of actors in international relations, older, more strongly proven variables for determining a reference point may have greater significance when employed in a similar quantitative study. The main issue here is the difficulty of converting qualitative analysis to macro-level quantitative data. The five complementary techniques - reference point, aspiration as reference point, heuristics, analogies, and emotion – identified in Mercer's (2005) oft-cited qualitative review of prospect theory presents an intriguing avenue for future research. If a quantitative aggregate of such values can be achieved, then the research conducted in this study can be examined alongside future studies of quantitative applications of prospect theory to better define and test its applicability to international relations.

Lastly, much can be said about the internal difficulties observed through the process of gathering and analyzing data for this research paper. Attempting to recreate Renshon's database of wars initiated by states with status deficits ended up being too time-consuming. Instead, this study utilized only a partial sample of his research obtained from the article, "Status Deficits

and War" (Renshon 2013). This meant that the study was only able to work with states with positive values of status deficits, which represented only states that fell under the "domain of losses". Additionally, the study was unable to expand the size of the database of wars, which consisted of only 49 cases of wars resulting in either a victory or a loss. Future research can focus on the recreation and expansion of the Google PageRank algorithm to include not only the entire 139 dataset of wars from Renshon's (2013) database, but also cases of non-war interstate disputes. Additionally, the inclusion of more control variables may help clarify the results. Though the statistical results were inconclusive, the possibilities for further research identified here provide a solid foundation for future research on prospect theory in international relations. ¤

Bibliography

Inter-State War Data (v4.0) 2007. Available from http://www.correlatesofwar.org/.

Boettcher, William A. 1995. "Context, Methods, Numbers, And Words: Prospect Theory in International Relations." Journal of Conflict Resolution no. 39 (3).

Butler, Christopher K. 2007. "Prospect Theory and Coercive Bargaining." Journal of Conflict Resolution no. 51 (2).

Haas, Mark L. 2002. "Prospect Theory and the Cuban Missile Crisis." International Studies Quarterly no. 45 (2).

Hancock, Landon E., and Joshua N. Weiss. 2011. "Prospect Theory and the Failure of the Oslo Accords." Peace & Change no. 36 (3).

He, Kai, and Huiyun Feng. 2009. "Leadership, Regime Security, and China's Policy Towards Taiwan: Prospect Theory and Taiwan Crises." The Pacific Review no. 22 (4).

He, Kai, and Huiyun Feng. 2012. "Why is There no NATO in Asia?' Revisited: Prospect Theory, Balance of Threat, and US Alliance Strategies." European Journal of International Relations no. 18 (2).

Holmes, Marcus. 2012. "Homeland Security as International Security? The Case for International Relations as Disciplinary Model." Journal of Homeland Security and Emergency Management no. 9 (1).

Jacob, Frank, and Michael Ehret. 2006. "Self-protection vs Opportunity Seeking in Business Buying Behavior: An Experimental Study." Journal of Business & Industrial Marketing no. 21 (2):110.

Jervis, Robert. 1992. "Political Implications of Loss Aversion." Political Psychology no. 13 (2).

Khaneman, Daniel, and Amos Tversky. 1979. "Prospect Theory: An Analysis of Decision under Risk " Econometrica no. 47 (2).

Kuhberger, Anton. 1998. "The Influence of Framing on Risky Decisions: A Meta-analysis." Organizational Behavior and Human Decision Processes no. 75 (1):23-55.

Levy, Jack S. 1992. "An Introduction to Prospect THeory." Political Psychology no. 13.

Levy, Jack S. 1996. "Loss Aversion, Framing, and Bargaining: The Implications of Prospect Theory for International Conflict." International Political Science Review no. 17 (2).

Levy, Jack S. 1997. "Prospect Theory, Rational Choice, and International Relations." International Studies Quartlery no. 41 (1).

Levy, Jack S. 2003. "Applications of Prospect Theory to Political Science." Synthese no. 135 (2).

Lindley, Dan, and Ryan Schildkraut. 2005. Is War Rational? The Extent of Miscalculation and Misperception as Causes of War. Istanbul: International Studies Association.

Luce, Robert Duncan, and Howard Laiffa. 1989. Games and Decisions: Introduction and Critical Survey. Reprint Edition ed: Dover Publications.

Lupovici, Amir. 2010. "The Emerging Fourth Wave of Deterrence Theory—Toward a New Research Agenda." International Studies Quarterly no. 54 (3).

McDermott, Rose. 1998. Risk-Taking in International Politics: Prospect Theory in American Foreign Policy Ann Arbor, MI: University of Michigan Press.

Mercer, Jonathan. 2005. "Prospect Theory and Political Science." Annual Reviews Political Science no. 8 (1).

Merom, Gil. 2003. How Democracies Lose Small Wars. UK: Cambridge University Press.

Renshon, Jonathan. 2013. Status Deficits and War. University of Wisconsin-Madison

Schaub, Gary. 2004. "Deterrence, Compellence, and Prospect Theory." Political Psychology no. 25 (3).

Shafir, Eldar. 1992. "Prospect Theory and Political Analysis: A Psychological Perspective." Political Psychology no. 13 (2).

Sobek, Markus. The PageRank Algorithm. eFactory 2003. Available from http://pr.efactory.de/e-pagerank-algorithm.shtml.

Tversky, Amos, and Daniel Kahneman. 1981. "The Framing of Decisions and the Psychology of Choice." Science no. 211 (4481).

Vis, Barbara. 2011. "Prospect Theory and Political Decision Making." Political Studies Review no. 11 (3).