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Prospect theory and foreign policy decision-making: Underexposed issues, advancements, and ways forward

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ABSTRACT

How much mileage can we get out of prospect theory to explain foreign policy decision-making? To answer this question, we first argue that risk as outcome uncertainty is the appropriate definition in prospect-theoretical applications. Then, we indicate that probability weighting—a crucial component of prospect theory—is typically ignored in such applications. We argue why this is problematic and suggest how to move forward. Next, we discuss how to establish the reference point in the face of outcomes in multiple dimensions, as is typically the case in foreign policy decision-making. Finally, we discuss what we have learnt regarding prospect theory's scope conditions and the differences across individuals in the theory's applicability. Overall, our contribution lies in identifying several underexposed or neglected issues (e.g., the definition of risk and probability weighting), in examining the advancements regarding prospect theory's scope conditions, and in discussing avenues for further research.

KEYWORDS Foreign policy analysis; risk; uncertainty; prospect theory; decision-making

What do we know about political and military leaders' willingness to take risk in their foreign policy decisions? This is one of the key questions for security policy that this forum addresses. In this paper, we contribute by assessing how much mileage we can get out of *prospect theory* (Kahneman & Tversky, 1979, 2000; Tversky & Kahneman, 1992) within the field of foreign policy analysis. The lion share of decisions by political actors relating to foreign policy are risky, which requires theoretical approaches that address such decisions. Expected utility theory (Von Neumann & Morgenstern, 1944)—underlying most rational choice approaches in political science and international relations (see e.g., Hug, 2014 for a discussion)—used to be the go-to theory. However, expected utility theory has proven to be descriptively inaccurate.

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People deviate from its predictions in systematic ways by, for instance, basing their decisions not on a final outcome but on deviations from a reference point. Prospect theory has incorporated insights on such deviations into a coherent theory. Prospect theory is now “the most influential behavioral theory of choice [under risk] in the social sciences” (Mercer, 2005, p. 1). Assessing the mileage of prospect theory, as originally developed in economics, to understand risk and foreign policy decision-making is thus particularly apt for this forum on risk in international security.¹

Given prospect theory’s influence in general, it is not surprising that it has regularly been used to explain foreign policy decision-making (for reviews, see Boettcher III, 2004; Jervis, 1994; Levy, 1997; 2003; McDermott, 2004; Mercer, 2005; Stein, 2017; Vis, 2011). In this article, we contribute to these earlier reviews in several ways. First, we discuss a relatively underexposed issue, namely what is the appropriate definition of risk in prospect-theoretical applications. We argue that this should be risk as outcome uncertainty—this is our first contribution.

Next, we discuss prospect theory’s four main characteristics and indicate that two of these—(1) reference dependence, that is people’s tendency to make decisions not based on the final outcome but relative to a reference point, and (2) probability weighting, meaning that the “effect of an outcome’s probability on an option’s perceived value is not linear” (Linde & Vis, 2017a, p. 104)—warrant closer examination. Probability weighting is a crucial component of prospect theory yet is typically ignored in prospect-theoretical applications in foreign policy analysis. We will argue why this is problematic and suggest how to move forward. This is our second contribution.

We then turn to reference dependence, or more specifically to how to define the reference point—a well-known challenge in prospect theory (see e.g., Mercer, 2005; Stein, 2017 for reviews)—*in the face of outcomes in multiple dimensions?* The latter addition is highly relevant to foreign policy decision-making, yet we know relatively little about this. We discuss a theoretical and an experimental way to deal with this challenge—our third contribution.

Our fourth and final contribution is to discuss the increased knowledge on prospect theory’s scope conditions and on differences across individuals in the theory’s applicability. This article is therefore not intended to be a comprehensive review of prospect-theoretical applications in foreign policy analysis. Instead, we assess what mileage prospect theory has in this field by discussing several underexposed or neglected issues, by indicating how to address these, by examining the advancements in identifying prospect theory’s scope conditions, and by discussing avenues for further research.

A note on risk and prospect theory’s characteristics

Before turning to prospect theory’s characteristics, let us first address the key concept of *risk*. We follow Linde and Vis (2017b) and identify two types of

risk. Type I relates to how risk is usually defined in everyday parlance, that is, as (close to) a synonym for “dangerous”: *risk as (expected) consequences*. The more negative are the expected consequences—typically a loss of votes or seats—the higher is this type I risk.² Prospect theory, as well as expected utility theory, use a different definition of risk. In these theories, it is the *uncertainty* of outcomes that makes decisions risky: the higher is the degree of uncertainty, the riskier is the decision (cf. McDermott, 1998, p. 39). Linde and Vis (2017b) labeled this *risk as outcome uncertainty* type II risk. Type II risk is obviously relevant for prospect-theoretical applications, since it is the theory’s conceptualization of risk. But also more generally, type II risk is relevant for foreign policy analysis, because foreign policy decisions are typically characterized by high outcome uncertainty (Friedman & Zeckhauser, 2018; Friedman, Baker, Mellers, Tetlock, & Zeckhauser, 2018). Risk as outcome uncertainty is therefore the appropriate definition for prospect-theoretical applications and for foreign policy analysis in general.

Prospect theory has four main characteristics that are well-known: (1) reference dependence, (2) loss aversion, (3) diminishing sensitivity, and (4) probability weighting (see e.g., Barberis, 2013, pp. 175–177). In the rest of this section, we describe these four characteristics.

Prospect theory’s first characteristic is *reference dependence*, meaning that people make decisions not based on the final outcome but relative to a reference point, oftentimes the status quo (see Mercer, 2005 for a discussion of different types of reference points). Hereby, people generally display the *reflection effect*, indicating that they are sensitive to how choices are presented or framed. When people make decisions involving moderately sized losses, they tend to be risk seeking. When people make decisions involving moderately sized gains, they tend to be risk averse. Risk seeking for losses and risk aversion for gains is the oftentimes invoked *two-fold pattern* of risk attitudes. Because reference dependence relates to a core challenge in prospect-theoretical applications “in the wild” (Camerer, 2003)—how to establish the reference point?—we come back to this characteristic in the section “Establishing the reference point with outcomes in multiple dimensions.”

Prospect theory’s second characteristic is *loss aversion*, that is people’s tendency to respond more strongly negatively to losses than they respond positively to equally sized gains (Kahneman, Knetsch, & Thaler, 1991; Tversky & Kahneman, 1981; see Ert & Erev, 2013; Jervis, 1994). Loss aversion has for instance been used to explain escalated commitment in military interventions (Taliaferro, 2004b), and why American policy makers fight harder and hold out longer in trade disputes with preventive objects (Berejikian & Early, 2013).

Prospect theory’s third characteristic is *diminishing sensitivity*, meaning that the farther is a given loss or gain from the reference point, the less is its impact on utility. For example, the utility of a 1% increase in votes is higher if it happens at 0 than if it is an addition to an already-large gain of

10% of the votes. Similarly, the disutility of a 1% vote loss is higher when compared to the current situation than if it added to an already-large loss of 10%.

The fourth and final characteristic of prospect theory is *probability weighting*, meaning that “the effect of an outcome’s probability on an option’s perceived value is not linear” (Linde & Vis, 2017a, p. 104), as it is in expected utility theory. More specifically, with probability weighting, “small probabilities (generally $p < 0.33$; see Wakker, 2010, pp. 203–206) are overweighted and large probabilities are underweighted” (Linde & Vis, 2017a, p. 104). We come back to probability weighting in the next section, because this characteristic is typically—and unduly—ignored in empirical applications.

The significance of probability weighting for foreign policy analysis

In the previous section, we discussed prospect theory’s four characteristics. Each of these is a necessary component of prospect theory. Foreign policy analysts have typically focused only on loss aversion and, especially, reference dependence and the reflection effect. In doing so, researchers have used only prospect theory’s value function and not its probability weighting function. However, an actor’s risk attitude is determined by both the shape of the value function *and* the shape of the probability weighting function. The resulting patterns of risk attitudes, which is formalized in so-called *cumulative* prospect theory (Tversky & Kahneman, 1992; see Stein, 2017, p. S255 for a brief discussion)—the so-to-speak second generation version of prospect theory that includes probability weighting—is *four-fold* instead of the in foreign policy analysis typically used two-fold pattern (e.g., Berejikian, 2004; Levi & Whyte, 1997). With the four-fold pattern, there is the well-known risk aversion in the gains domains and risk seeking in the losses domain. However, when the probability of a gain is small (typically < 0.33 , see above), people are risk seeking instead of risk averse (explaining why people participate in lotteries). And when the probability of a loss is small, they are risk averse rather than risk seeing (explaining why people buy insurance).

In most prospect-theoretical applications in political science, including foreign policy analysis, the focus is on this so-called two-fold pattern of risk attitudes: risk seeking for losses and risk aversion for gains.³ Interestingly, in some of the older reviews and discussions on prospect theory, the centrality of probability weighting in prospect theory is discussed (Levy, 1994a, 1994b; Shafir, 1994). Other studies mention the probability weighting function, but state explicitly that they focus on the value function only (e.g., Levi & Whyte, 1997). Then there are studies that discuss probability weighting, but that do not apply it empirically (e.g., Elms, 2008; Haerem, Kuvaas, Bakken, & Karlsen, 2011). To the best of our knowledge, there are only a few—older—studies that both discuss probability weighting *and* apply it in their empirical

analysis. In her work in the 1956-Suez crisis, McDermott (1998, pp. 154–155), for example, discusses how the probability assessment of different Western leaders regarding Nassar taking control over large parts of the Middle East influenced their decisions. The European leaders assumed that this probability was *high*, which made them treat this assumption as *certain*, causing them to overweight the outcome, which explains their willingness to resort to force. U.S. President Eisenhower, conversely, did not assess the risk of Nassar taking control of large parts of the Middle East to be high, explaining why he opted for diplomatic means instead. And in his analysis of the Cuban missile crisis, Haas (2001) indicates that when Kennedy and Khrushchev were confronted with moderate probability outcomes and operated in a domain of loss, they made the risk seeking choice. In those instances where the probability of the outcome occurring approached certainty (such as Kennedy believing that Khrushchev would respond with actions that would lead to military conflict), the decision maker (here: Kennedy) made a risk averse decision.

For prospect theory to be applied properly, probability weighting should be taken into account. This means that researchers using prospect theory need to indicate what are the probabilities of a specific outcome occurring. By no means this is an easy task. As Shafir (1994, p. 155) states, “political leaders’ probability estimates are usually unavailable and can only be approximately inferred” (see also Levy, 1994b, pp. 135–138). Still, such approximation may be possible. Haas (2001), for instance, used qualitative probability assessments (very low; very high, et cetera) to account for the specific decisions taken in the Cuba Missile crisis, such as Khrushchev’s decision to send missiles to Cuba. Also McDermott (1998) inferred probability assessment in her study on American foreign policy making.

Note that if probabilities of an outcome occurring would be always be moderately sized (that is, $\geq .33$), the resulting pattern of risk attitudes would *de facto* be a two-fold one, meaning that substantively it would be possible to focus on the value function only. However, in the context of foreign policy decision-making, the significant events in international relations—whether these are the signing of a treaty or a military conflict—are typically rare events (Cook, 2014; King & Zeng, 2001). Consequently, the objects of study within foreign policy analysis are almost exclusively small probability events that something good (or bad) happens (e.g., security measures in avoiding a terrorist attack or peace talks to avoid nuclear escalation). This makes the four-fold pattern highly relevant and the neglect of probability weighting an unjustified simplification.

Establishing the reference point with outcomes in multiple dimensions

A well-known challenge that researchers who apply prospect theory must address, is how to establish the reference point. Even when researchers

follow Kahneman and Tversky (1979) and take the status quo as reference point, establishing this point is typically already challenging (e.g., Mercer, 2005, p. 4). What makes establishing the reference point in foreign policy decision-making especially challenging is that actors typically face outcomes in *multiple* dimensions (Stein, 2017). In the latter case, which dimension is taken as the reference point? For instance, if a foreign policy decision is expected to strengthen the government's international standing (gain in dimension 1) but to weaken its domestic standing (loss in dimension 2), does the government then find itself in a domain of gains or a domain of losses? Making decisions with outcomes in multiple dimensions is hard (Renshon & Renshon, 2008).

How to address this challenge of establishing a reference point when the decision maker faces outcomes in multiple dimensions? One way to proceed is the approach taken by Taliaferro (2004a, p. 37). In his study of why great power oftentimes engage in risky military and/or diplomatic interventions in areas that do not directly threaten the security of a great power's homeland, Taliaferro assumes based on the theoretical approach of defensive realism that the leaders use only one dimension to evaluate outcomes: the international arena. Although questionable from other perspectives such as liberalism, Taliaferro's (2004a) solution is interesting. The solution is, however, also theoretical, yielding the subsequent empirical question whether leaders indeed only use the international arena to evaluate outcomes. To properly apply prospect theory to foreign policy decision-making, we should therefore also learn more about how politicians (empirically) make such multidimensional trade-offs.

Some first experimental evidence on how they make multidimensional trade-offs comes from a survey experiment with members of the Dutch parliament as the main participants [$n = 46$] (Linde & Vis, 2017a). Linde and Vis confronted the participants with choices in two dimensions—economic (policy) and electoral (votes)—to establish with of these they would use as their reference point. While the effect was weak, Linde and Vis found suggestive evidence for a reference point in terms of votes. This is a relevant finding for foreign policy analysts, because recent (non-prospect theoretical) findings suggest that foreign policy decisions can influence government popularity (Aldrich, Gelpi, Feaver, Reifler, & Thompson Sharp, 2006; Dannenbaum, 2011; Karol & Miguel, 2007).

Scope conditions of prospect theory

In this section, we turn from zooming into issues related to two of prospect theory's characteristics to what we have learned regarding prospect theory's scope conditions. We show that substantial progress has been made in

terms of establishing the conditions under which prospect theory is applicable and indicate avenues for further research.

As Stein (2017) correctly noted, “prospect theory, developed in the lab, paid little attention to the scope conditions that would shape its impact outside” (p. S252). Filling this lacuna, Stein discussed prospect theory’s scope conditions, some of which are particularly relevant for foreign policy decision-making. Here, we discuss those and add additional ones based on other literature. A first scope condition is the *type of domain*. The reflection effect has been found to be stronger in problems related to human lives than related to monetary issues (Fagley & Miller, 1997; see Stein, 2017, p. S253). Relatedly, framing effects were found to be stronger in the context of missing information (Kuhberger, 1995; Mandel, 2001; see Stein, 2017, p. S254). Both this latter finding and the one on decisions with outcomes relating to human lives are oftentimes applicable to foreign policy decision-making.

Another scope condition, not mentioned by Stein (2017) but relevant to foreign policy decision-making, is *accountability*, that is, the expectation by the decision maker that she may have to justify her decisions to others (Lerner & Tetlock, 1999). There is evidence that a decision maker becomes more risk seeking when she bears responsibility both for her own outcome and that of others (Pahlke, Strasser, & Vieider, 2015), like in foreign policy decision-making. This finding may relate to other studies’ result that accountability reduces loss aversion (Pahlke, Strasser, & Vieider, 2012; Vieider, 2009).⁴

There are also several scope conditions on prospect theory’s applicability that concern individual variation in risk propensity. A first relevant study by Bruhin, Fehr-Duba, and Epper (2010) examined whether there are different “types” of individuals. Based on three experimental datasets, two Swiss and one Chinese, they found that there are two main types. The first category, comprising about 80% of the individuals from both countries, were typified as cumulative prospect theory (CPT) types, because they exhibited significant deviations from linear probability weighting as predicted under prospect theory. The other type, comprising the other 20% of the individuals, were typified as expected utility theory (EUT) types, because their probability weighting was almost perfectly linear. The latter can be viewed as the *homo economici*. Within the CPT-types, there was some variation across the two countries’ participants, with the Chinese being more risk seeking than the Swiss. The latter is in line with existing studies’ findings that Chinese are generally more risk seeking than are westerners (Brumagim & Xianhua, 2005; Hsee & Weber, 1999).

For foreign policy analysts, and political scientists more generally, an important follow-up question is: Who then are these $\pm 20\%$ of the people who behave largely in line with expected utility theory? Bruhin et al.’s

(2010, p. 1402) own work does not bring us much further in this regard, since they found that the only factor that had a significant effect was sex: The overall EUT-group is composed of men. Some further, more directly relevant, evidence on who are these people who behave in line with rational choice theory is provided by Rathbun, Kertzer, and Paradis (2017). Based on lab experiments with students from a U.S. research university [$n = 204$] and archival research on German foreign policy making in the 1920s, Rathbun et al. demonstrated that the *homo economicus* has a pro-self social-value orientation and high epistemic motivation. A pro-self social-value orientation is characterized by egoistic behavior (Kertzer & Rathbun, 2015), and high epistemic motivation is a desire and willingness to think rationally (Rathbun et al., 2017, pp. S36–S39). In Rathbun et al.'s sample, 29% were of this pro-self social-value orientation high epistemic-type (p. S45). This number is thus comparable to, though somewhat higher than, the 20% EUT-types Bruhin et al. (2010) identified.

There are also other studies that have examined factors influencing individual variation in risk propensity. Kowert and Hermann (1997), for instance, demonstrated by means of a survey among American political science students [$n = 126$] that personality traits as captured by the Big Five influenced whether they behaved in line with prospect theory's predictions. The Big Five are the five groups in which different personality traits have been found to cluster consistently: (1) neuroticism, which captures traits such as anxiety and moodiness; (2) extraversion, capturing traits like assertiveness and enthusiasm; (3) openness, capturing traits like imagination and versatility; (4) agreeableness, capturing traits like trust and tolerance; (5) conscientiousness, capturing traits like precision and efficiency (see e.g., McCrae & Costa, 1997). Kowert and Hermann (1997) found that those individuals who score high on conscientiousness did behave in line with prospect theory. Other groups of participants, conversely, did not: Participants low (high) on anxiety were risk seeking (risk averse) irrespective of the frame and were thus both risk and frame invariant. Open and intuitive participants were especially likely to be risk seeking when facing gains, contra prospect theory. The latter also hold for agreeable/altruistic participants who are risk averse especially when facing losses (Kowert & Hermann, 1997, p. 623). The evidence on the way in which politicians differ from the general public in their (average) score on the Big Five dimensions is somewhat mixed (Best, 2011; Hanania, 2017), making it difficult to draw conclusions regarding Kowert and Hermann's (1997) findings for foreign decision-making.

Another factor that influences individual variation in risk propensity is *experience* (see Tetlock & Gardner, 2015), which has been found to strengthen strategic thinking and thereby leads to less biased information processing (Hafner-Burton, Hughes, & Victor, 2013). Whether the net effect of experience would be positive or negative is unclear, though, because experience

also fosters overconfidence (Hafner-Burton et al., 2013) and overconfidence has been found to result in more risk-taking decision-making (Sheffer & Loewen, 2017). Moreover, inexperience of a president may result in foreign policy failures, even when the team of advisors around the president is experienced. Specifically, Saunders (2017) demonstrated that George W. Bush's inexperience in matters relating to foreign policy exacerbated his advisers' biases, whereas "his father's experience cast a long shadow over many of the same officials" (p. S221).

Implications for explaining foreign policy decision-making by prospect theory

So, where does this bring us regarding the mileage we can get out of prospect theory for explaining foreign policy decision-making?

First, we have argued that for prospect theory to be applicable, a precondition is that researchers adopt an appropriate definition of the key concept of risk. We proposed that risk as outcome uncertainty (type II risk) is exactly such a definition. Using this definition means that a *risky* outcome does not need to be a *dangerous* one. Risk defined as outcome uncertainty indicates that prospect theory may also apply to potentially advantageous outcomes, such as the advancement of a state's interest through cooperation.⁵ The latter is a topic on which there is hardly any literature and where prospect theory's mileage may be high. Assuming that opting for cooperation comes with more uncertainty—and is thus riskier—than would remaining at the status quo, insights from prospect theory can help to explain when a state would be willing to accept this risk. Moreover, not conflating "risk" with danger or bad things more generally and instead defining it in terms of outcome uncertainty also makes clear how (normatively) bad outcomes might also occur in the context of a gains domain. This will be the case when the uncertainty around an outcome is relatively low, but when this outcome in itself is (normatively) bad. An example hereof would be starting a war. If the uncertainty around not starting a war is much higher than is the uncertainty around starting the war, the latter involves the lowest amount of risk. When probabilities are moderately large, prospect theory predicts that starting a war then occurs when the decision maker is in a gains domain.

Another important precondition for getting mileage out of prospect theory is that this theory is used properly. We have shown that to date, foreign policy analysts almost exclusively used prospect theory's value function for determining whether a decision maker is risk averse or risk seeking. However, in prospect theory, risk attitudes are truly shaped by both this value function and by the probability weighting function, resulting in a four-fold pattern of risk attitudes. We argued that ignoring or neglecting probability weighting

in prospect-theoretical applications is unjustified, especially in foreign policy decision-making, and that future applications should therefore take it into account.

Next, we identified that an important challenge in prospect-theoretical applications “in the wild” is how to identify the reference point when there are outcomes in multiple dimensions. We discussed a theoretical and experimental way to address this challenge, but also indicated that more work is to be done here. Because they allow for a controlled setting, experiments offer the most promising avenue for future research here. Ideally, these experiments should be conducted with political elites as the main participants. This will be challenging, but not impossible, as testified by experiments with members of national parliaments from different countries (Linde & Vis, 2017a; Sheffer, Loewen, Soroka, Walgrave, & Shaefer, 2017) or with high level military decision makers (Haerem et al., 2011).

Focusing on the challenge of decision makers’ facing outcomes in multiple dimensions also brings to the fore another interesting issue that has received very little attention in the prospect-theoretical literature to date: the possibility of counter framing. Suppose that there are two interest groups, one who cares mostly about how the economy is doing in terms of employment (*A*) and another who cares mostly on how it is doing in terms of trade (*B*). These interest groups’ reference points will consequently differ: *A* will take the level of employment as its reference point and *B* the terms of trade. This means that these interest groups may have competing frames of the state of the economy. Specifically, *A* and *B* will provide competing frames—that is counter frame—when the level of employment is blossoming (deteriorating) yet the terms of trade are declining (improving). The empirical question then is which of these the government will take as its reference point: *A*’s level of employment or *B*’s terms of trade? As we indicated, we still now very little about how actors make such multidimensional trade-offs, yet understanding how they do is crucial for understanding political decision-making and thus an important avenue for further research.

Finally, we demonstrated that there has been substantial progress in terms of identifying prospect theory’s scope conditions, which is important for prospect theory’s mileage in foreign policy analysis. We, for example, discussed the results on the differences across individuals in prospect theory’s applicability that are likely relevant for explaining foreign policy decision-making. While most people behave in line with prospect theory, about $\pm 20\%$ of the people rather behave largely in line with expected utility theory. A relevant avenue for further research would be to try and establish what part of, or even who in, the political and military elites taking foreign policy decisions are these *homo economici* (and who, thus, do not behave in line with prospect theory). Also for this question, experiments with political or military elites as key participants would be a promising way forward.

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Notes

1. There are other theories and approaches in foreign policy analysis in which risk plays some role, for instance in combination with power distributions and perceptions (see e.g., Bueno de Mesquita, 1981; Kim & Bueno de Mesquita, 1995; Taliaferro, 2004a; Eckles & Schaffner, 2011).
2. This is, for example, the definition that underlies many studies within foreign policy analysis on the diversionary use of force (e.g. Levy, 1996; Kisangani & Pickering, 2007; Powell, 2014).
3. The following makes use of Vieider and Vis (2018).
4. But see Lerner and Tetlock (1999) for a discussion of studies showing that loss aversion gets stronger in the face of accountability.
5. Thanks to an anonymous reviewer for bringing this to our attention.

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