Prospect Theory and Political Decision Making

FREE

Ferdinand M. Vieider, Department of Economics, Ludwig Maximilian University of Munich and Barbara Vis, Utrecht University School of Governance, Utrecht University

https://doi.org/10.1093/acrefore/9780190228637.013.979

Published online: 25 June 2019

Summary

Prospect theory—a psychologically founded account of decision making under risk and uncertainty—revolutionized how economists and, later, political scientists thought about decision making under uncertainty. Conceptually, prospect theory is based on two central notions: *reference dependence*, which is the notion that the utility of outcomes is defined over changes in outcomes from a reference point instead of over absolute outcome levels; and *likelihood dependence*, which is the notion that people distort probabilities non-linearly when making a decision. Likelihood dependence gives rise to the *possibility* and *certainty effects*—changes in probabilities are given much more weight if they fall toward the probability endpoints than if they fall into intermediate probability ranges. Reference dependence gives rise to the *reflection effect*, predicting mirrored risk attitudes for gains and for losses; and to *loss aversion*, predicting that people display a disproportionate dislike for losses.

Prospect theory has been extensively applied in the literature on political decision making. Two observations stand out. One, some aspects, such as the reflection effect, have received considerably more attention than others, such as loss aversion or likelihood dependence. Two, there is a twin challenge arising from the combination of this selective modelling and *ex post* rationalization. A step-wise procedure may help making modelling approaches more principled and systematic. This could furthermore help predicting future decision making behaviour—an aspect that has been neglected in favour of fitting past data.

Keywords: prospect theory, loss aversion, probability weighting, political decision making

Subjects: Political Behavior, Political Psychology, Qualitative Political Methodology

Introduction

Rational theories of choice offer a useful normative yardstick for decision making under risk and uncertainty in politics and elsewhere.[1] However, the descriptive accuracy of such theories—their ability to account for the decisions under uncertainty we actually observe—has been shown to fall short of the mark in a long string of findings (Allais, 1953; Ellsberg, 1961; Green & Shapiro, 1994; Schoemaker, 1982; Vickrey, 1945). Although solutions to some of the shortcomings had been proposed here and there before (Markowitz, 1952; Preston & Baratta, 1948), it was only with Kahneman and Tversky's (1979) article on prospect theory that these solutions were organized into a coherent modeling framework. This article revolutionized the way economists and political scientists thought about decision making under uncertainty.[2] Since the lion's share of decisions by political actors take place under such conditions, it is not surprising that prospect theory has

been applied in numerous analyses of political decision making (for reviews, see, e.g., Boettcher, 2004; Levy, 1992, 1997; Jervis, 1994; Shafir, 1994; McDermott, 2004; Mercer, 2005; Vis, 2011; Stein, 2017).

Prospect theory proposes a psychologically founded account of decision making under uncertainty, representing uncertainty preferences as a multifaceted concept. The major conceptual insights on which the theory is based can be summarized by *reference dependence* and *likelihood dependence*. Reference dependence entails that the utility people derive from a decision is defined over changes in outcomes rather than over absolute outcome levels.

Likelihood dependence captures the observation that people tend to distort probabilities nonlinearly when making a decision. One of the main psychological intuitions underlying both these departures from expected utility theory is the principle of *decreasing sensitivity*. In terms of utility, decreasing sensitivity implies that a given change in outcomes receives less weight the farther it falls from a reference outcome, resulting in concave utility for gains and convex utility for losses. In terms of probabilities, decreasing sensitivity entails that a given change in probabilities receives much more weight when it falls close to the probability endpoints of 0 and 1 than when it falls into intermediate probability ranges.

The second major psychological principle is *loss aversion*—the insight that people tend to weigh a given loss considerably more heavily than an equivalent gain (Tversky & Kahneman, 1991). The upshot of all of this is that risk preferences for a given situation may depend on a variety of factors, including (1) whether the situation is construed as a pure gain, pure loss, or mixed (gain and loss) outcome situation; (2) the importance of the stakes involved; and (3) the subjective probability attached to the different outcomes. This will often result in complex modeling issues that need to be addressed carefully and in a principled way before making predictions about how somebody may decide in a given situation. This does not only make the discourse when applying prospect theory rather complex, it also makes it necessary to clearly articulate the kind of prospect or probability distribution underlying the decision—something that is rarely done in practice (for exceptions, see, e.g., McDermott, 1998; Haas, 2001). This issue is further complicated by the fact that the representation of such prospects is often subjective (see Jervis, 1994, pp. 38–39; Shafir, 1994, p. 155).

As shown below, some stylized facts underlying prospect theory have captured the imagination of political scientists more than others. Foremost among these is the *framing* or *reflection effect*—the stylized finding that people tend to be risk averse for gains and risk seeking for losses (Tversky & Kahneman, 1981). While reference dependence, which underlies the framing effect, is certainly one of the central elements of prospect theory, economists have especially emphasized its other consequence—*loss aversion* (Levi & Whyte, 1997, is an example of a study in political decision making focusing on loss aversion). The importance of loss aversion can be traced to the observation that almost all real-world decisions entail some gains and some losses and that risk aversion over small-stakes decisions is difficult to conceptualize if not through loss aversion (Rabin & Thaler, 2001). Beyond issues of their relative merit, loss aversion and the framing effect often continue to be treated jointly and even confused in applied papers (e.g., Tezcur, 2016), resulting in issues of identification and lack of conceptual clarity.[3]

This article builds on the ongoing discussion of how to address the challenges in applying prospect theory to political decisions (see, e.g., Boettcher, 2004; Levy, 1992, 1997; McDermott, 2004; Mercer, 2005; Shafir, 1994; for reviews and discussions) by concentrating on the *methodological* challenges of applying prospect theory to political decision making. Our focus on methodological challenges makes this article especially relevant for those readers who already have some background in prospect theory. To also accommodate those readers who are novices in this area, prospect theory and expected utility theory are contrasted briefly in the section "First, Choose Your Reference Point." Such readers are also advised to first read one of the older reviews cited above (Mercer, 2005, is a good starting point). This article concentrates on two methodological challenges in particular. The first concerns the degree to which existing studies have focused on specific aspects of prospect theory rather than applied the full conceptual apparatus. The second aim consists in assessing whether the literature has tried to maximize the ex post fit to the data to the detriment of clean ex ante predictions. While the latter is a general problem in the social sciences, it seems particularly pertinent for applications of prospect theory, where the multiple parameters of the model afford endless possibilities to maximize data fitting, which may not contribute to our ability to truly *predict* decision making under uncertainty. Our aim with this discussion is to reveal the current methodological weak spots in prospect-theoretical applications to political decision making and to indicate some constructive ways forward.

Prospect Theory for Decisions Under Uncertainty

Different from existing reviews of prospect theory in political science (see references in the section "Introduction"), this article tries to directly describe the type of uncertainty attitudes we can expect to encounter conditional on the decision situation.[4] Each of the sections to follow starts by discussing the general issue at hand, drawing mostly on literature from economics and psychology. Subsequently, we indicate how this general notion is taken up—or not taken up—in prospect-theoretical applications on political decision making.

It is beyond the scope of this article to provide a comprehensive assessment of all relevant studies in political science. Instead, we start by conducting a review of a selection of prospect-theoretical applications or reviews that were published from 2004; onward, that is the last year in which comprehensive reviews of prospect-theoretical applications in political decision making appeared (Boettcher, 2004; McDermott, 2004). The articles were selected in four steps:

Step 1. In May 2018, we conducted a Web of Science cited author search of "Kahneman, 1979," looking up only citations of Kahneman and Tversky, 1979, in *Econometrica* and allowing for different typos in the journal's title. Only citations from the Social Science Citation Index (SSCI) were included. This yielded 11,612 articles in total.

Step 2. Of those 11,612 articles, we selected those from the Web of Science categories "Political Science" (n=529) and "International Relations" (n=175).

Step 3. Next, we selected all articles from the top 20% of the SSCI of each category. Online Appendix A1 gives an overview of these journals. Although this selection is, of course, somewhat arbitrary, it should allow us to pick up well-cited journals in the field. Moreover, about half of the 593 articles from Step 2, namely, 247, appeared in this top 20%.

Step 4. Of these 247, we close-read those articles with prospect theory and/or loss aversion in the title and/or abstract. There were 21 articles that met this criterion (18 applications, 3 review articles).

In addition to these 21 articles, we also included some additional studies that do not meet the selection criteria set forth above but that are either an example to follow (e.g., McDermott, 1998), book-length contributions (e.g., Berejikian, 2004; Weyland, 1996), or that in some other respect constitute interesting illustrations of a point this article is making. It is thus not our aim to be comprehensive here but to use relatively recent or relevant studies to illustrate the arguments.

First, Choose Your Reference Point

The first step in predicting whether a decision maker may be uncertainty averse or uncertainty seeking in a given situation is to determine whether the situation is best conceived of as one over pure gains, one over pure losses, or as a mixed decision involving both gains and losses. Figure 1 illustrates this point by showing prospect theory's reference-dependent utility function. Other than under expected utility theory, where preferences are defined over total wealth, preferences in prospect theory are defined over changes in wealth from a reference point (indicated at 0 in Figure 1). This results in decreasing sensitivity over such changes, as captured by the concave pattern of the utility for gains and the convex patterns of the utility for losses—a given change in wealth matters relatively less the farther away from the reference point it falls. Loss aversion is indicated by the kink in the utility function at the origin—a given loss looms larger than an equivalent gain. This also means that loss aversion can only be identified using mixed prospects involving both gains and losses and is thus inconsequential for decisions that involve only losses and for the reflection effect, which captures regularities in decision patterns for pure gains and pure losses.

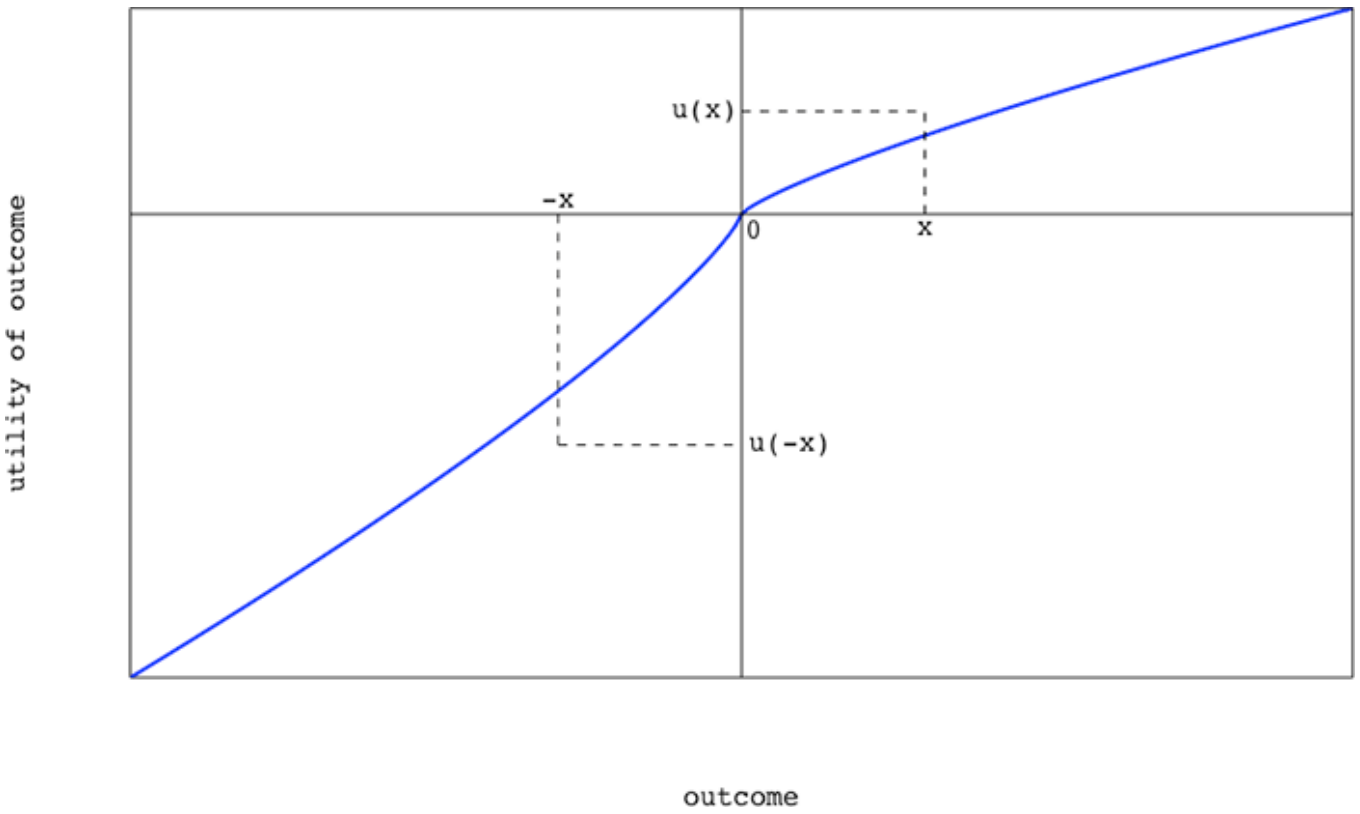

Figure 1. Prospect theory's reference-dependent utility function.

Alas, the determination of the reference point is also one of the most difficult steps. As Mercer (2005, p. 4) correctly notes, "Political scientists all wrestle with the problem of determining an actor's or group's frame. The obstacles are formidable and the temptation to reason backwards, from choice to domain to frame, are strong." Kahneman and Tversky (1979) identified the current situation or status quo as the reference point, as do many applications in political decision making (e.g., Levi & Whyte, 1997; Vis, 2010). Subsequent studies have shown evidence for a wide variety of alternative reference points, such as buying prices of houses or financial assets (Odean, 1998), aspiration levels (for instance, Taliaferro, 2004b, used political leaders' aspiration levels such as their territorial aspirations), or even stochastic reference points that require comparisons of outcomes contingent on the state of the world before any uncertainty is resolved (Schmidt, Starmer, & Sugden, 2008; Sugden, 2003; for a discussion of different types of reference points in political decision making, see, e.g., Mercer, 2005).

Even if one were to settle on the status quo as the reference point, this does not immediately solve the issue. In a dynamic setting, one would still need to determine the speed with which the reference point adjusts to changes in outcomes. While the explanation of some phenomena requires reference points to adjust quickly and for people to be myopic (see, e.g., explanations of the equity premium puzzle in economics: Gneezy & Potters, 1997; Mehra & Prescott, 1985), other phenomena require people to adjust their reference point rather slowly (such as, e.g., the disposition effect; see Odean, 1998). Schumacher, Van de Wardt, Vis, and Baggesen Klitgaard (2015) is an example of a study of political decision making in which the reference point—there called the aspiration level (see, e.g., Bendor, Diermeier, Siegel, & Ting, 2011)—changes

dynamically. In Schumacher and colleagues' study on party platform change, the aspiration level adapts dynamically, being adjusted upward if performance exceeds the aspiration level and adjusted downward if it is below it. Specifically, Schumacher et al. (2015, p. 1044) "propose that a party's office aspiration adjusts dynamically, whereby failure (i.e., being in opposition) motivates a party to lower its expectation of office and success (i.e., being in government) increases its office aspiration."

An example of how to deal with the problem of empirically establishing the reference point is Sheafer and Shenhav (2013), a study on congruence between democratic values among the public, a country's institutions, and political stability. As they state, "Although not referring to prospect theory and to the reference point, we believe that the empirical approach taken by Inglehart and Welzel (2005, pp. 186–191) and presented earlier, is an acceptable solution. As discussed earlier, they measured the difference between the supply of freedom (the country's level of democracy) and the demand for freedom (the level of democratic values held by the people). Applying this empirical solution, the reference point is where demand and supply are equal" (Sheafer & Shenhav, 2013, p. 238).

Different assumptions on how quickly the reference point adjusts—such as, for instance, those underlying myopic loss aversion and the disposition effect mentioned earlier—must not necessarily result in contradictions if a specific process is determining these reference points. Some studies in economics have made a start at building formal models of reference point determination. These models typically rely on an old intuition—that reference points need to be somehow *salient* (e.g., Hershey & Schoemaker, 1985). Some 21st-century studies in this field have taken a stab at formalizing this concept, which may also contribute to some aspects of likelihood dependence (Bordalo, Gennaioli, & Shleifer, 2012). Other economic theories have tried to directly model the reference point formation process, coming up with a variety of different "equilibria" (Kőszegi & Rabin, 2006, 2007). While promising, this body of literature is still somewhat too nascent to allow for definite conclusions. For one, it has at times proved difficult to determine ex ante which equilibrium should be applied in a given situation, bringing the problem back to square one. In addition, these theories often need to make simplifying assumptions to keep the problem tractable, which means that they entail a trade-off between a formal account of reference point formation and the generality of the underlying theory.[5] These issues may well be fixable, but only time will tell whether this will indeed increase predictive performance.[6]

Yes, But What Are the Chances?

Once the reference point is fixed, one needs to determine what the chances are of—or probabilities attached to—various outcomes. Economists have often eschewed this question by studying artificial situations of *risk*, where all outcomes and probabilities are given and objectively known to the decision maker. When looking at real decisions in the real world, things tend to be more complex, since the subjective probabilities of a decision maker need to be determined before the decision situation can be described and predictions can be made.[7] While such probabilities can in principle be measured or inferred from choices (e.g., Abdellaoui, Baillon, Placido, & Wakker, 2011), in practice this often proves tricky.

Oftentimes scholars thus need to make assumptions on subjective probabilities (e.g., that they are equal to objective probabilities where the latter exist and can be quantified; Barseghyan, Molinari, O'Donoghue, & Teitelbaum, 2013). Even where copious data on the uncertainty-generating process are available to decision makers, however, subjective probabilities may not be accurate. Overconfidence—the phenomenon whereby subjective probability ranges are on average too narrow relative to the true uncertainty surrounding the probabilities of a given situation—is a particularly thorny issue.

The reason why determining probabilities is so important can be found in likelihood dependence, and particularly in the two main stylized facts emerging from it. One, people tend to attribute a high weight to a change in probability from 0 (or impossibility) to a small probability—a phenomenon known as the *possibility effect*. Concomitantly, people tend to attribute much weight to changes of probabilities from large values to certainty—a phenomenon known as the *certainty effect*. Taken together, this means that in intermediate probability ranges even relatively large changes have little impact on decisions. Figure 2 illustrates this point. Figure 2 depicts a typical probability weighting function as it has been found in aggregate data (e.g., Abdellaoui, 2000; L'Haridon & Vieider, 2018). The dashed diagonal line represents the case of linear probability treatment. The weighting function deviates from such a treatment in systematic ways. It shoots up for small probabilities, which are thus overweighed in decisions. This is the possibility effect. It again shoots up when moving from large probabilities to certainty—the certainty effect. In intermediate regions, even relatively large changes in probabilities have little effect on decisions, a phenomenon known as *likelihood insensitivity*.

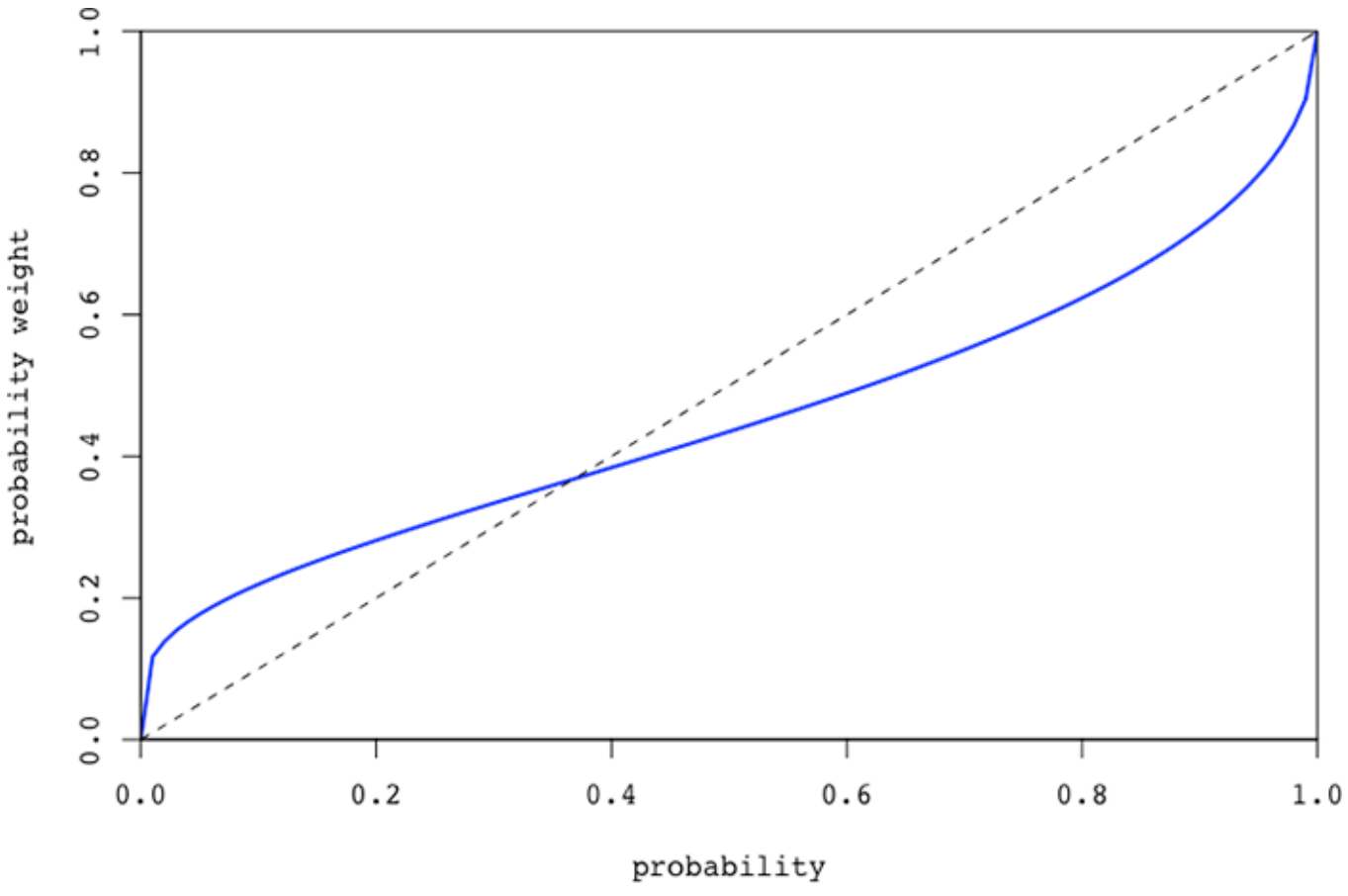

Figure 2. Probability weighting function.

While often neglected in political science applications (see later in this section for an overview), probability distortions can be important in practice, especially in extreme situations where certainty may seem within reach. An important rationale for their introduction into the economics literature was that it is difficult to explain the coexistence of insurance and gambling without probability distortions.[8]

Political scientists have often used decreasing sensitivity in utility to model the reflection effect, resulting in risk aversion for gains and risk seeking for losses. The complete prospect theory setup, however, makes it necessary to combine probability distortions with utility curvature to make inferences on expected risk attitudes. For gains, the probability weights depicted in Figure 1 are attached to the best possible outcome. This means that for moderate to large probabilities, probability weighting will further reinforce risk aversion incorporated in the utility function. For small probabilities of gains, however, the two will pull in opposite directions. It is then a question of the relative strength of utility curvature and probability weighting whether we may observe risk aversion or risk seeking (or indeed risk neutrality, if they cancel each other out completely). The answer will in part depend on the size of the outcome and on the strength of decreasing sensitivity. Experiments with monetary outcomes tend to indicate that especially for very small probabilities, probability weighting tends to overpower utility curvature up to at least (hypothetical) amounts of the order of 100,000 euros for private individuals (Bouchouicha & Vieider, 2017; Fehr-Duda, Bruhin, Epper, & Schubert, 2010; Scholten & Read, 2014). A similar yet mirrored story holds for losses. Here the stylized fact most often encountered in the political science literature is one of risk seeking. Probability weights are now, however, applied to the *worst* possible outcome. This means that for moderate to large probabilities of the loss, probability weighting will indeed reinforce risk-taking for losses. If the likelihood attached to large losses is small, however, that may well result in risk *aversion* for losses—the very insurance motive discussed above. Whether it does indeed result in risk aversion in practice will again depend on the relative importance of decreasing sensitivity in utility and the overweighting of small probabilities.

When examining existing reviews of prospect theory and applications in the literature on political decision making with an eye to the notion of probability weighting, three things stand out: (1) many researchers in political science and international relations are aware of the centrality of probability weighting in prospect theory; (2) in prospect-theoretical applications, probability weighting is usually ignored (see Neilson, 2003, p. 171); and (3) this ignoring of probability weighting seems to occur more and more as the time passes since the first applications in political decision making in the early 1990s. Let us elaborate on these points some more.

Many studies in political decision making that apply prospect theory do not mention probability weighting at all (Berejikian, 2004; Bhatti et al., 2018; De Vries, 2018; Fuhrmann & Early, 2008; He & Feng, 2012; Jervis, 1994; Johnson, Myagkov, & Orbell, 2013; McDermott, 1992; Morrissette, 2010; Sheafer & Shenhav, 2013; Tezcur, 2016; Trampusch, 2014; Van de Wardt, 2015; Vis, 2009, 2010; Vis & Van Kersbergen, 2007).[9] Then there are studies that do mention probability weighting

but indicate that they ignore it (e.g., Levi & Whyte, 1997; Weyland, 2002; McDermott, Fowler, & Smirnov, 2008). Weyland (2002, p. 38, note 3), for instance, states that "for reasons of simplicity and clarity, this study draws only on the central finding of prospect theory and does not consider other interesting results concerning the way in which people frame decision options and subjectively weigh the probabilities of these scenario's occurrence." McDermott et al (2008), on the evolutionary origins of prospect theory preferences, concentrates on the twofold pattern of risk seeking in the domain of losses and risk aversion in the domain of gains. Still, before introducing their model based on optimal foraging theory, McDermott et al. (2008) also amply discussed the probability weighting function. And they come back to the latter when discussing the implications of prospect theory for extant political models, in particular American spatial voting models (p. 344).

Some studies do mention probability weighting, sometimes in a footnote, but do not include it in the analysis itself (e.g., Baekgaard, 2017; Elms, 2008; Haerem, Kuvaas, Bakken, & Karlsen, 2011). Elms (2008), for instance, concentrated on framing and loss aversion in her re-reading of existing studies in international political economy through a behavioral economics lens. Similarly, Haerem et al. (2011) discussed the fourfold pattern of risk attitudes but do not incorporate this in their analysis of whether military decision makers behave in line with prospect theory. Baekgaard (2017), moreover, conducted three experiments (one with Danish citizens and two with MTurkers from the United States) to examine whether prospect theory applies to public sector reforms. Baekgaard (2017) discussed probability weighting but formulates hypotheses only on risk aversion and the reflection effect.

Interestingly, many review articles do actually discuss probability weighting. For example, Levy (1994) indicated that international relations scholars should take into account that risk propensities are different from the so-called twofold pattern when probabilities are small or very small. This is especially important, but not exclusively so, in the case of foreign policy decision making—think of the probability of a nuclear war but also conflict more generally, both of which are small-probability events with huge consequences. Levy (1994, p. 14) rightly indicates that this means

> that analysts who apply prospect theory need to be quite sensitive to the probabilities which decision-makers attach to various outcomes. If probabilities are in the moderate range, the standard prospect theory hypotheses based on the value function can be applied. But if probabilities are small, one cannot apply these hypotheses directly without making assumptions about the respective shapes of the value and probability-weighting functions. The analyst's task is complicated further by uncertainty regarding the transition point from over-weighting to under-weighting of probabilities, particularly for the more complex choice problems typically found in international relations.

Other examples of reviews mentioning probability weighting are Shafir (1994) and Stein (2017).

McDermott (1998) is one of the few studies in which probability weighting is not only extensively discussed (pp. 30–33, 192–193, and note 56), but also applied empirically. In her case study of the 1956 Suez crisis (pp. 154–155), McDermott explains that European leaders—who assumed that the probability that Nassar would take over large parts of the Middle East was (very) high—underweighted this likelihood, making them willing to turn to force. The American president Eisenhower assessed this risk to be low, conversely, which explains why he rather chose diplomatic options. Another study in which probability weighting is included explicitly in the empirical analysis is Haas (2001), a study of the Cuban Missile Crisis. The probability assessments in Haas's study are qualitative in nature (very high, low, etc.), based on the available primary and secondary sources. Haas (2001, p. 266, emphasis in original) shows that

> when Kennedy and Khrushchev operated in the domain of losses *and* their probability estimates for the principal outcomes were in the moderate-to-high range, these leaders tended to be [uncertainty seeking]. When, however, their probability estimates for prominent outcomes approached certainty, they were much more cautious.

Also Schaub (2004), focusing on the different degrees of coercive effort involved in deterrence (less effort required) and compellence (more effort required), incorporates probability weighting. Schaub, for instance, states that "when the deterrer's threat is very credible, it means that the chances of the adversary winning the gamble of defiance are low. But when the chances of winning the gamble are low (i.e., below .34), the adversary's tendency to prefer the sure bet of compliance will be attenuated" (2004, p. 401).[10] Relatedly, Linde and Vis (2017) showed by means of an experiment with Dutch members of parliament as their main participants that politicians also display probability weighting, further showing the importance of accounting for such patterns.

The discussion above may create some confusion, since a clear solution is usually not easy to come by in cases where contradictions may arise from utility curvature versus probability weighting. At the very least, however, awareness of the issue ought to make it possible to determine the robustness of one's inferences to ranges of subjective probabilities.

Conceivably, there may be an even bigger issue threatening applications of prospect theory to political decision making. Once again, the main stylized fact that has been used consists in a uniformly concave utility function for gains and a convex function for losses (generally combined, at least implicitly, with linear probability weights). However, outcomes in political decision making are seldom continuous, unlike the monetary outcomes for which these utility functions have been derived and estimated. Winning an election or not is a 0–1 outcome that may well render the very notion of decreasing sensitivity in utility meaningless. We will shortly discuss different ways of modeling such situations, which may be more suitable in many situations faced by political scientists. First, however, we need to tackle another major stylized fact of prospect theory—loss aversion.

Whatever You Do, Do Not Lose

Reference dependence is arguably the most frequently used stylized prospect theory fact in political science and international relations. One of its consequences—the reflection of attitudes from risk averse to risk seeking, also known as the "framing effect"—has received more attention in political science than the other, loss aversion. However, whenever a prospect entails both potential gains and potential losses, loss aversion is likely to apply to the losses, making people shy away from the prospect. With an often-cited figure of losses looming about twice as large as gains (Akalis, 2008; Horowitz & McConnell, 2002), loss aversion can indeed be a strong force counteracting risky undertakings. While there is some disagreement as to whether specific situations should be modeled as taking place over mixed gain–loss prospects or over pure gains or losses (Bateman et al., 2005; Sydnor, 2010), the great majority of real-world decisions are best construed as being over mixed prospects. Furthermore, most of the risk aversion we observe—especially in decisions involving relatively small stakes—is likely driven by loss aversion (Köbberling & Wakker, 2005; Markowitz, 1952; Rabin, 2000; Samuelson, 1963).

Such loss aversion could, for instance, easily lead to inaction on the part of governments. Let us consider a head of government who wants to implement a series of policy reforms. Some of them may be controversial with either the parliamentary majority backing the government and/or the electorate. This may well lead to inaction if loss aversion is applied to potential bad outcomes or vested interests threatened by the reform—something that has been termed the "status quo bias" (Kahneman, Knetsch, & Thaler, 1991). Assume that a given reform is likely to go through and to be successful but that it also has a small likelihood of failing, including the potential to topple the government if a rebel faction in parliament gets its way. Even if the likelihood of such a negative outcome is small, the disutility induced by loss aversion—potentially further enhanced by the overweighting of the small probability attached to the loss—may well make the government shy away from the reform. There is also another sense in which loss aversion may frustrate reform efforts. To the extent that people are loss averse, policies that do not result in Pareto improvements (i.e., where some people are better off while nobody is worse off) can be expected to meet strong resistance from the public. This is because people who stand to lose will put up much more resistance than people who stand to gain will be supportive. Such asymmetries may contribute to difficulties in reforming advanced democracies (see, e.g., Pierson, 1994; Van Kersbergen & Vis, 2014), as we witness them frequently.

This does not mean that loss aversion must always overpower all other motives. Let us imagine the following scenario. A country wants to annex a disputed territory, on which a neighbor also lays a claim. It has found a clever way of doing so and goes ahead with the annexation. What do we conclude from that? Based only on framing effects, one could conclude that the country found itself somehow "in a loss frame," having adopted the expanded territory as a reference point, so that there are no gain outcomes and loss aversion does not bite. This seems overly creative in terms of reference point engineering. Instead, we would be better off by trying to assess the situation in more detail. What is the likelihood that the aggressor will get away with the annexation, and what is the benefit attached to that outcome? What is the likelihood of a bad outcome, and what form will that outcome take? Some bad outcomes, such as temporary

sanctions, may well be judged to be small and carry little disutility. Probabilities attached to truly bad outcomes carrying large disutility, such as open war, may be judged to be small or negligible. In all these cases loss aversion may not be strong enough to tip the balance.

There are studies in political decision making that explicitly focus on loss aversion. Berejikian and Early (2013), for example, concentrated on loss aversion instead of prospect theory as a whole to account for how hard American policymakers fight to win trade disputes. Instead of adopting "all of the assumptions and attendant complexities of prospect theory to invoke the insights provided by loss aversion," Berejikian and Early draw on "the more narrowly focused neuroscientific research agenda on loss aversion," since that, according to them, "provides a more detailed, nuanced understanding of how loss aversion affects human decision making than prospect theory does" (2013, pp. 651–652). By drawing on the neuroscientific agenda, Berejikian and Early (2013, pp. 652–653) indicate that gains are processed in the brain's "reward system," the system that is activated also in the case of, for example, food consumption or when receiving financial rewards. The brain, conversely, processes losses in an "aversion system" related to strong negative emotions, such as pain or disgust. The response to losses in the brain is stronger than is the response to gains. Berejikian and Early (2013, p. 654) argued that "because loss aversion shapes the resources and risks that decision makers are willing to undertake to achieve their objectives, (. . .) this will also affect the resolve that political leaders demonstrate when they confront foreign policy conflicts." They then move on to defining preventive policies, that is, policies that are "primarily driven by the desire to mitigate an erosion of current assets" (p. 654), such as protecting existing territorial holdings or preventing the loss of alliance partners. In other studies, loss aversion seems relevant but is not mentioned. Bhatti, Dahlgaard, Hansen, and Hansen (2018), for instance, examine by means of a field experiment in which letters were sent to >60,000 potential first-time Danish voters whether Go Out to Vote Campaigns are effective. They hypothesize that those letters framed as losses should have the largest effect (they found no difference between the letters framed as gains and those as losses). Interestingly, while this hypothesis clearly comes from loss aversion, the authors do not mention it.

And What If I Simply Do Not Care?

We have assumed thus far that all outcomes of a decision situation are about equally important. This may not be realistic. Incentives may create salient outcomes—for instance, by attributing different importance to outcomes depending on whether they just achieve a target or just fall short of it. Such situations are often modeled by shifts in reference points, keeping the rest of the functional apparatus of prospect theory intact. This is clearly an assumption—and a questionable one to boot.

Imagine that a political party lags behind in the polls to win an election and considers a risky strategy providing a small (subjective) probability of overtaking the other party or of gaining an absolute majority and a large probability of losing votes. Implicitly, this type of setup thus assumes a reference point fixed at 50% + 1 vote/seats (for the absolute majority), or of q + 1% if the second party receives a share of q% of the vote.[11] The combination of the overweighting of the small probability of winning the election—resulting in risk seeking for gains—and the

underweighting of the large probability of losing the election (resulting in risk seeking for losses) may just be able to explain such behavior. However, the prospect remains mixed, and unrealistically extreme parameters may be needed for the uncertainty-seeking tendencies arising from probability weighting to overcome loss aversion—even once we abstract from the consideration that decision makers are supposed to be risk averse for large gains due to diminishing sensitivity in utility. Even this stylized example thus seems to at least call for a numerical calibration exercise, which will require some explicit modeling of all the decision elements involved.

The issue is that it is far from clear whether a straight application of prospect theory as outlined above is a good way of modeling the situation. Some guidance may be found in applications of prospect theory to organizational behavior and management (March & Shapira, 1997). If any outcome below 50% of the vote does really not matter at all, one may indeed want to neglect that part, modeling the decision as one over small probability gains alone and neglecting the losses entirely (see, e.g., Lefebvre & Vieider, 2014, for such a model involving compensation of company chief executive officers through stock options). Loss aversion then no longer applies, and we can explain the behavior with risk seeking for small probability gains. Most of the political science literature, on the other hand, may have thought of this situation as one of risk seeking for losses —where the "loss situation" is given by having fallen behind in the polls and implicitly modeled through convex utility for losses. We consider our explanation more plausible. While the supposed reference point does not differ across the two situations, our explanation explicitly does away with loss aversion that would otherwise be problematic.[12] We also do not need decreasing sensitivity in utility, which is unlikely to be realistic in this scenario. Notice also that we did not achieve this by manipulating preference parameters but rather by carefully considering the incentives faced by the decision maker.

The example just discussed is highly stylized, with only a binary outcome that matters—win or lose the election. More plausibly, the extent of the loss will matter at least to some degree, for instance because it may determine whether a party enters parliament at all in the presence of minimum vote thresholds, or whether it keeps open the window to participate in government as a junior partner, or whether it gets to lead the opposition block. This indeed raises the scenario of several coexisting reference points—a scenario that traditional prospect-theoretical models are ill-equipped to handle and which render simple divisions into "gains" and "losses" impractical. Nevertheless, such complex scenarios can be organized using principled discussions based on qualitative prospect theory patterns, just as presented above for the simplest case. The danger, of course, lies in the fact that such multiple reference points provide even more flexibility in ex post data fitting. It thus becomes even more important to make ex ante predictions and to test those on the data.

Your Preferences or My Preferences?

Absent specific data on the decision maker, one must by necessity resort to so-called *strong* versions of the theory. That is, in addition to a reference-dependent utility function and the nonlinear weighting of probabilities applied to subjective probability representations, one needs

to concomitantly adopt "typical" parameter values, or at least general qualitative patterns. This can be problematic. For one, the appropriate parameters may change depending on the subject population or context. Aggregate patterns have been found to be at least qualitatively stable across studies, albeit with more or less systematic quantitative differences across contexts that are still poorly understood. For instance, L'Haridon and Vieider (2018) documented systematic differences in preference patterns across countries, with richer countries found to be less risk tolerant, more sensitive toward probabilities, and less loss averse than poor countries. In addition, individual decision makers may swerve significantly from aggregate values (see, e.g., Haerem, Kuvaas, Bakken, & Karlsen, 2011, for a discussion), thus casting doubt on the validity of using average or median parameter values for inferences on the decision-making processes of individuals. To provide but one example, the popular reflection effect resulting in the fourfold pattern of risk preferences has received very little support at the individual level (Cohen, Jaffray, & Said, 1987; Schoemaker, 1990).

This also raises the question whether politicians are like other people, and hence how accurate predictions based on average parameters (often obtained with students) may be. The evidence to date is still scarce, but there is 21st-century experimental evidence showing that politicians also display the reflection effect (e.g., Linde & Vis, 2017; Sheffer et al., 2018; Stolwijk & Vis, 2018) and suggestive evidence for probability weighting by politicians (Linde & Vis, 2017). At the same time, there are also indications that politicians' decision making may differ from that of other people. Politicians may, for example, be even less probabilistically sensitive than the general population, for instance because the large stakes over which decisions take place make probability differences less salient (Bouchouicha & Vieider, 2017; Fehr-Duda et al., 2010), and based on evidence that likelihood insensitivity is generally increased in decisions for others (Pahlke, Strasser, & Vieider, 2015; Vieider, Villegas-Palacio, Martinsson, & Majia, 2016). Some evidence also exists to the point that political experts—who are typically not politicians themselves—are less accurate forecasters of political events than are lay persons (Tetlock, 2005). More evidence on this point seems desirable.

Discussion and Conclusion: Ways Forward

The clearest insight resulting from our critical assessment of the literature is arguably just how challenging it is to apply prospect theory to political decision making. For one, the decision contexts tend to be extremely complex, and simplifications of such contexts—although possible and even necessary—are never innocuous. The highly subjective nature of evaluations of a given situation makes it necessary to speculate about the decision maker's view of the situation, including potential reference points, the utility of different outcomes, and the subjective probabilities attached to such outcomes. The flip side of such challenges is that it is also too easy to account for observed behavior—*any* observed behavior—through prospect theory, given the many free parameters. A principled and disciplined approach is thus essential if this literature is to move forward and to converge to some accepted conclusions, instead of what may read as ad hoc explanations for handfuls of situations.

Such challenges are in no way unique to political science and have also been encountered in economics and in psychology. One promising solution being tried in economics—admittedly amid much resistance from some scholars and in a not entirely consistent way—is to preregister hypotheses and analysis plans. Once again, such preregistration would likely look very different in political science, since the analysis to be carried out may also often take very different forms. Nonetheless, there may be some benefits to be had. For instance, one could try and take the following steps:

Step 1. Create a stylized ex ante "model," which can be discursive and qualitative in nature. It should:

(a) discuss the reference point(s) in the given situation;

(b) the subjective probability (ranges) of the most important outcomes; and

(c) the prospect theory parameters that may be relevant and why they would be expected to result in risk seeking or risk aversion, or why the outcome may be ambiguous. Preregistration seems desirable to make the process as transparent as possible. Note that the measurement of the reference point(s)—i.e., a) in Step 1—can be done both deductively (by means of external standards, for instance) and inductively (e.g., by means of in-depth case studies). In the latter situation, to limit the risk of ex post fitting, it is key to discuss in advance the process through which the reference point(s) is to be determined. The same holds for the subjective probability (ranges) of the most important outcomes, that is, (b) in Step 1. The methodology and decision criteria underlying the analysis of a more explorative research endeavor can be explicitly stated in the preregistration document and in the resulting work, which again makes the process fully transparent.

Step 2. Take the model to the data and determine whether it can account for the observed behavior. If it cannot, openly discuss how the modeling framework will have to change in order to accommodate the observed behavior. Discuss the plausibility of the old versus new, amended, modeling assumptions, trying to be as objective as possible. Avoid attributing too much weight to the data—your original model may be right and the situation at hand may be an outlier.

Step 3. If you accept the modifications produced by the data, incorporate them into your model, and make predictions for new data. Then start over.

This stepwise procedure is not complete or exhaustive. The hope is that it could lead to a principled learning process, in which priors about given models of behavior can be updated in a systematic and principled fashion.

Appendix: Overview of the Top 20% of Journals Based on the Impact Factor as Used in the SSCI

For political science, the top 20% of journals in the SSCI (May 2018, *n* = 36) are *American Journal of Political Science, World Politics, Review of International Political Economy, International Organization, Political Analysis, British Journal of Political Science, American Political Science Review, Perspectives on Politics, Journal of European Public Policy, Public Administration, Journal of Conflict Resolution, Regulation & Governance, European Journal of Political Research, Annual Review of Political Science, Political Psychology, Socio-Economic Review, Governance, African Affairs, West European Politics, Comparative Political Studies, Political Communication, Review of International Organizations, Political Geography, Journal of Peace Research, Post-Soviet Affairs, JCMS—Journal of Common Market Studies, Philosophy & Public Affairs, Journal of Political Philosophy, International Theory, Policy Studies Journal, Political Behavior, Annals of the American Academy of Political and Social Science, Politics & Gender, South European Society and Politics, International Political Sociology*, and *New Left Review*.

For international relations, the top 20% of journals in the SSCI (May 2018, *n* = 16) are *World Politics, Review of International Political Economy, International Organization, International Security, Journal of Conflict Resolution, Security Dialogue, Foreign Affairs, Review of International Organizations, Common Market Law Review, Journal of Peace Research, European Journal of International Relations, JCMS—Journal of Common Market Studies, International Theory, International Political Sociology, International Affairs, and American Journal of International Law*. For international relations, we added two more journals, which are known for prospect theory applications: *Foreign Policy Analysis* and *International Studies Quarterly*. Also note that many journals of the international relations top 20% are also in the political science top 20%.

References

Abdellaoui, M. (2000). Parameter-free elicitation of utility and probability weighting functions. *Management Science*, *46*(11), 1497–1512.

Abdellaoui, M., Baillon, A., Placido, L., & Wakker, P. P. (2011). The rich domain of uncertainty: Source functions and their experimental implementation. *American Economic Review*, *101*(2), 695–723.

Akalis, S. A. (2008). A new spin on losses looming larger than gains: Asymmetric implicit associations from slot machine experience. *Journal of Behavioral Decision Making*, *21*(4), 378–398.

Allais, M. (1953). Le comportement de l'homme rationnel devant le risque: critique des postulats et axiomes de l'école Américaine. *Econometrica*, *21*(4), 503–546.

Baekgaard, M. (2017). Prospect theory and public service outcomes: Examining risk preferences in relation to public sector reforms. *Public Administration*, *95*(4), 927–942.

Barseghyan, L., Molinari, F., O'Donoghue, T., & Teitelbaum, J. (2013). The nature of risk preferences: Evidence from insurance choices. *American Economic Review*, *103*(6), 2499–2529.

Bateman, I., Kahneman, D., Munro, A., Starmer, C., & Sugden, R. (2005). Testing competing models of loss aversion: An adversarial collaboration. *Journal of Public Economics*, *89*(8), 1561–1580.

Bendor, J., Diermeier, D., Siegel, D. A., & Ting, M. M. (2011). *A behavioral theory of elections*. Princeton, NJ: Princeton University Press.

Berejikian, J. D. (2004). *International relations under risk:* Albany: State University of New York Press.

Berejikian, J. D., & Early, B. R. (2013). Loss aversion and foreign policy resolve. *Political Psychology*, *34*(5), 649–671.

Bhatti, Y., Dahlgaard, J. O., Hansen, J. H., & Hansen, K. M. (2018). Can governments use get out the vote letters to solve Europe's turnout crisis? Evidence from a field experiment. *West European Politics*, *41*(1), 240–260.

Boettcher, W. 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.

Bordalo, P., Gennaioli, N., & Shleifer, A. (2012). Salience theory of choice under risk. *The Quarterly Journal of Economics*, *127*(3), 1243–1285.

Bouchouicha, R., & Vieider, F. M. (2017). Accommodating stake effects under prospect theory. *Journal of Risk and Uncertainty*, *55*(1), 1–28.

Cohen, M., Jaffray, J.-Y., & Said, T. (1987). Experimental comparison of individual behavior under risk and uncertainty for gains and for losses. *Organizational Behavior and Human Decision Processes*, *39*, 1–22.

De Vries, C. (2018). *Euroscepticism and the future of European integration*. Oxford, UK: Oxford University Press.

Ellsberg, D. (1961). Risk, ambiguity and the savage axioms. *Quarterly Journal of Economics*, *75*(4), 643–669.

Elms, D. K. (2008). New directions for IPE: Drawing from behavioral economics. *International Studies Review*, *10*(2), 239–265.

Farnham, B. (1992). Roosevelt and the Munich crisis: Insights from prospect theory. *Political Psychology*, *13*(2), 205–235.

Fehr-Duda, H., Bruhin, A., Epper, T. F., & Schubert, R. (2010). Rationality on the rise: Why relative risk aversion increases with stake size. *Journal of Risk and Uncertainty*, *40*(2), 147–180.

Fox, C. R., & Hadar, L. (2006). "Decisions from experience" Sampling error + prospect theory: Reconsidering Hertwig, Barron, Weber & Erev (2004). *Judgment and Decision Making*, *1*(2), 159–161.

Friedman, M., & Savage, L. J. (1948). The utility analysis of choices involving risk. *Journal of Political Economy*,*LVI*(4), 279–304.

Fuhrmann, M., & Early, B. R. (2008). Following START: Risk acceptance and the 1991–1992 presidential nuclear initiatives. *Foreign Policy Analysis*, *4*(1), 21–43.

Gneezy, U., & Potters, J. (1997). An experiment on risk taking and evaluation periods. *Quarterly Journal of Economics*, *112*(2), 631–645.

Green, D. P., & Shapiro, I. (1994). *Pathologies of rational choice theory: A critique of applications in political science*. New Haven, CT: Yale University Press.

Haas, M. L. (2001). Prospect theory and the Cuban Missile Crisis. *International Studies Quarterly*, *45*(2), 241–270.

Haerem, T., Kuvaas, B., Bakken, B., & Karlsen, T. (2011). Do military decision makers behave as predicted by prospect theory? *Journal of Behavioral Decision Making*, *24*(5), 482–497.

He, K., & Feng, H. (2012). "Why is there no NATO in Asia?" Revisited: Prospect theory, balance of threat, and US alliance strategies. *European Journal of International Relations*, *18*(2), 227–250.

Hershey, J. C., & Schoemaker, P. J. H. (1985). Probability versus certainty equivalence methods in utility measurement: Are they equivalent? *Management Science*, *31*(10), 1213–1231.

Hertwig, R., & Ortmann, A. (2001). Experimental practices in economics: A methodological challenge for psychologists? *The Behavioral and Brain Sciences*, *24*(3), 383–403.

Horowitz, J. K., & McConnell, K. E. (2002). A review of WTA/WTP studies. *Journal of Environmental Economics and Management*, *44*(3), 427–447.

Jervis, R. (1994). The political implications of loss aversion. In B. Farnham (Ed.), *Avoiding losses/taking risks: Prospect theory and international conflict* (pp. 23–40). Ann Arbor: University of Michigan Press.

Johnson, T., Myagkov, M. G., & Orbell, J. M. (2013). Distinctive preferences toward risk in the substantive domain of sociality. *Political Psychology*, *34*(1), 1–22.

Kahneman, D., Knetsch, J. L., & Thaler, R. L. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *The Journal of Economic Perspectives*, *5*(1), 193–206.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–292.

Köbberling, V., & Wakker, P. P. (2005). An index of loss aversion. *Journal of Economic Theory*, *122*(1), 119–131.

Kőszegi, B., & Rabin, M. (2006). A model of reference-dependent preferences. *The Quarterly Journal of Economics*, *121*(4), 1133–1165.

Kőszegi, B., & Rabin, M. (2007). Reference-dependent risk attitudes. *The American Economic Review*, *97*(4), 1047–1073.

Lefebvre, M., & Vieider, F. M. (2014). Risk taking of executives under different incentive contracts: Experimental evidence. *Journal of Economic Behavior & Organization*, *97*(1), 27–36.

Levi, A. S., & Whyte, G. (1997). A cross-cultural exploration of the reference dependence of crucial group decisions under risk: Japan's 1941 decision for war. *The Journal of Conflict Resolution*, *41*(6), 792–813.

Levy, J. S. (1992). Prospect theory and international relations: Theoretical applications and analytical problems. *Political Psychology*, *13*(2), 283–310.

Levy, J. S. (1994). Prospect theory and international relations: Theoretical applications and analytical problems. In B. Farnham (Ed.), *Avoiding losses/taking risks: Prospect theory and international conflict* (pp. 119–146). Ann Arbor: University of Michigan Press.

Levy, J. S. (1997). Prospect theory, rational choice, and international relations. *International Studies Quarterly*, *141*(1), 87–112.

L'Haridon, O., & Vieider, F. M. (2018). All over the map: A worldwide comparison of risk preferences. *Quantitative Economics*, *10*, 185–215.

Linde, J., & Vis, B. (2017). Do politicians take risks like the rest of us? An experimental test of prospect theory under MPs. *Political Psychology*, *38*(1), 101–117.

March, J. G., & Shapira, Z. (1997). Managerial perspectives on risk and risk taking. *Management Science*, *33*(11), 1404–1418.

Markowitz, H. (1952). The utility of wealth. *The Journal of Political Economy*, *60*(2), 151–158.

McDermott, R. (1992). Prospect theory in international relations: The Iranian hostage rescue mission. *Political Psychology*, *13*(2), 237–263.

McDermott, R. (1998). *Risk-taking in international politics: Prospect theory in American foreign policy*. Ann Arbor: University of Michigan Press.

McDermott, R. (2004). Prospect theory in political science: Gains and losses from the first decade. *Political Psychology*, *25*(2), 289–312.

McDermott, R., Fowler, J. H., & Smirnov, O. (2008). On the evolutionary origin of prospect theory. *The Journal of Politics*, *70*(2), 335–350.

Mehra, R., & Prescott, E. C. (1985). The equity premium: A puzzle. *Journal of Monetary Economics*, *15*(2), 145–161.

Mercer, J. (2005). Prospect theory and political science. *Annual Review of Political Science*, *8*, 1–21.

Morrissette, J. J. (2010). Rationality and risk-taking in Russia's first Chechen war: Toward a theory of cognitive realism. *European Political Science Review*, *2*(2), 187–210.

Neilson, W. S. (2003). Probability transformations in the study of behavior toward risk. *Synthese*, *135*(2), 171–192.

Odean, T. (1998). Are investors reluctant to realize their losses? *Journal of Finance*, *53*(5), 1775–1798.

Pahlke, J., Strasser, S., & Vieider, F. M. (2015). Responsibility effects in decision making under risk. *Journal of Risk and Uncertainty*, *51*(2), 125–146.

Pierson, P. (1994). *Dismantling the welfare state? Reagan, Thatcher, and the politics of retrenchment*. Cambridge Studies in Comparative Politics. Cambridge, UK: Cambridge University Press.

Preston, M. G., & Baratta, P. (1948). An experimental study of the auction-value of an uncertain outcome. *The American Journal of Psychology*, *61*(2), 183.

Quiggin, J. (1982). A theory of anticipated utility. *Journal of Economic Behavior & Organization*, *3*(4), 323–343.

Rabin, M. (2000). Risk aversion and expected utility theory: A calibration theorem. *Econometrica*, *68*, 1281–1292.

Rabin, M., & Thaler, R. H. (2001). Anomalies: Risk aversion. *The Journal of Economic Perspectives*, *15*(1), 219–232.

Samuelson, P. A. (1963). Risk and uncertainty: A fallacy of large numbers. *Scientia*, *57*(98), 108–113.

Schaub, G., Jr. (2004). Deterrence, compellence, and prospect theory. *Political Psychology*, *25*(3), 389–410.

Schmidt, U., Starmer, C., & Sugden, R. (2008). Third-generation prospect theory. *Journal of Risk and Uncertainty*, *36*(3), 203–223.

Schoemaker, P. J. H. (1982). The expected utility model: Its variants, purposes, evidence and limitations. *Journal of Economic Literature*, *XX*, 529–563.

Schoemaker, P. J. H. (1990). Are risk attitudes related across domains and response modes? *Management Science*, *36*(12), 1451–1463.

Scholten, M., & Read, D. (2014). Prospect theory and the forgotten fourfold pattern of risk preferences. *Journal of Risk and Uncertainty*, *48*(1), 67–83.

Schumacher, G., Van de Wardt, M., Vis, B., & Baggesen Klitgaard, M. (2015). How aspiration to office conditions the impact of government participation on party platform change. *American Journal of Political Science*, *59*(4), 1040–1054.

Shafir, E. (1994). Prospect theory and political analysis: A psychological perspective. In B. Farnham (Ed.), *Avoiding losses/taking risks: Prospect theory and international conflict* (pp. 147–158). Ann Arbor: University of Michigan Press.

Sheafer, T., & Shenhav, S. (2013). Political culture congruence and political stability: Revisiting the congruence hypothesis with prospect theory. *Journal of Conflict Resolution*, *57*(2), 232–257.

Sheffer, L., Loewen, P. J., Soroka, S., Walgrave, S., & Shaefer, T. (2018). Nonrepresentative representatives: An experimental study of the decision making of elected politicians. *American Political Science Review*, *112*(2), 302–321.

Stein, J. G. (2017). The micro-foundations of international relations theory: Psychology and behavioral economics. *International Organization*, *71*(Supplement 2017), S249–S263.

Stolwijk, S., & Vis, B. (2018). *Do politicians use the representativeness heuristic?* Unpublished manuscript.

Sugden, R. (2003). Reference-dependent subjective expected utility. *Journal of Economic Theory*, *111*(2), 172–191.

Sydnor, J. (2010). (Over)insuring modest risks. *American Economic Journal: Applied Economics*, *2*(4), 177–199.

Taliaferro, J. W. (2004a). *Balancing risks: Great power intervention in the periphery*. Ithaca, NY: Cornell University Press.

Taliaferro, J. W. (2004b). Power politics and the balance of risk: Hypotheses on great power intervention in the periphery. *Political Psychology*, *25*(2), 177–211.

Tetlock, P. E. (2005). *Expert political judgment: How good is it? How can we know?* Princeton, NJ: Princeton University Press.

Tezcur, G. M. (2016). Ordinary people, extraordinary risks: Participation in an ethnic rebellion. *American Political Science Review*, *110*(2), 247–264.

Trampusch, C. (2014). Why preferences and institutions change: A systematic process analysis of credit rating in Germany. *European Journal of Political Research*, *53*(2), 328–344.

Tversky, A., & Kahneman, D. (1981). The framing of decision and the psychology of choice. *Science*, *211*(1), 453–458.

Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics*, *106*(4), 1039–1061.

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, *5*(4), 297–323.

Van de Wardt, M. (2015). Desperate needs, desperate deeds: Why mainstream parties respond to the issues of niche parties. *West European Politics*, *38*(1), 93–122.

Van Kersbergen, K., & Vis, B. (2014). *Comparative welfare state politics: Development opportunities, and reform*. Cambridge, UK: Cambridge University Press.

Vickrey, W. (1945). Measuring marginal utility by reactions to risk. *Econometrica*, *13*(4), 319.

Vieider, F. M., Villegas-Palacio, C., Martinsson, P., & Majia, M. (2016). Risk taking for oneself and others: A structural model approach. *Economic Inquiry*, *54*(2), 879–894.

Vis, B. (2009). Governments and unpopular social policy reform: Biting the bullet or steering clear? *European Journal of Political Research*, *48*(1), 31–57.

Vis, B. (2010). *Politics of risk-taking: Welfare state reform in advanced democracies*. Amsterdam, The Netherlands: Amsterdam University Press.

Vis, B. (2011). Prospect theory and political decision making. *Political Studies Review*, *9*(3), 334–343.

Vis, B., & Van Kersbergen, K. (2007). Why and how do political actors pursue risky reforms? *Journal of Theoretical Politics*, *19*(2), 153–172.

Wakker, P. P. (2010). *Prospect theory: For risk and ambiguity*. New York, NY: Cambridge University Press.

Weyland, K. (1996). Risk taking in Latin American economic restructuring: Lessons from prospect theory. *International Studies Quarterly*, *40*(2), 185–207.

Weyland, K. (2002). *The politics of market reform in fragile democracies: Argentina, Brazil, Peru, and Venezuela*. Princeton, NJ: Princeton University Press.

Notes

1. The term *uncertainty* is typically used in cases where the exact probabilities are unknown, while the term *risk* is used for the less realistic case in which probabilities are objectively given. We will henceforth use the term *uncertainty* and take risk to be a special case of uncertainty.

2. The original formulation of prospect theory had some problems and limitations. By incorporating the idea of rank dependence (Quiggin, 1982), Tversky and Kahneman (1992) made the theory mathematically consistent and expanded its applicability from the case of risk (known probabilities) to uncertainty (unknown probabilities); see Wakker (2010) for details of the differences.

3. For instance, Tezcur's (2016, p. 249, emphasis added) claim that "if individuals perceive themselves operating in the domain of losses, they *develop* loss aversion" is simply incorrect. If they indeed purely operate in the loss domain, then loss aversion is simply not identified and can thus have no influence on decisions.

4. Note that the difficulty at least partly arises from the fact that researchers want to move beyond descriptive fit or what could be labeled "post-dictions" instead of predictions. If a reader is interested in postdictions, he or she can substitute "opportunity" for every occurrence of the word "challenge" in the text to follow.

5. For instance, the model proposed by Köszegi and Rabin (2007) simplified the setup adopted by treating probabilities linearly. This, in turn, means that the theory has difficulties accounting for the coexistence of gambling and insurance decisions—one of the main historical issues that have eventually led to the emergence of prospect theory.

6. Baekgaard (2017, pp. 938–939) made a somewhat related observation—which applies to prospect-theoretical applications more generally: "Gain and loss domains are surprisingly ambiguous concepts in the literature. Usually, they are manipulated . . . indirect[ly, calling] into question whether findings reflect differences between gain and loss domains or rather the valence of the words used . . . A useful extension would therefore be to study whether the findings can be reproduced if gains and losses are manipulated differently than in the current experiments, for instance, by explicitly stating whether reform attempts are undertaken to avoid losses or increase gains."

7. Some scholars in psychology have taken a different, albeit equally artificial, approach, whereby people are required to sample from unknown distributions to get to know the probabilities before making a decision (Hertwig & Ortmann, 2001). While initial claims suggested that data in this paradigm fundamentally contradicted prospect theory, other scholars quickly showed that the alleged differences were due to sampling issues that resulted in discrepancies between the true and perceived probabilities. Taking this into account, prospect theory indeed performed rather well in accounting for the observed decision patterns (Fox & Hadar, 2006). This example further underlines the importance of getting the subjective probabilities right.

8. This was an issue that plagued expected utility theory from the onset. Early on, Vickrey (1945) remarked that risky trade-offs could not be used in practice to measure utility curvature due to the distortions observed in insurance and gambling decisions. Friedman and Savage (1948) tried to salvage the expected utility paradigm by introducing ad hoc inflection points into the utility function, only to get severely criticized for it by Markowitz (1952). Markowitz's solution was to introduce reference dependence into the utility function, combined with qualitatively different patterns for small and large stakes that could capture insurance and gambling decisions. The main issue with that implementation, however, is that it is difficult to reconcile with empirical observations showing the prevalence of insurance for small losses rather than large losses (Sydnor, 2010).

9. Note that in De Vries (2018), prospect theory is not the main theory to be applied, but insights from prospect theory are used to explain that voters with a negative European Union (EU) differential— the difference between the evaluation of the EU status quo and an EU alternative state—are in a frame of loss and therefore risk seeking (i.e., wiling to change the status quo), while those with a positive EU differential are in a gains domain and hence risk averse (i.e., unwilling to change the status quo).

10. Other studies that also discuss probability weighting are Taliaferro (2004a) and Farnham (1992).

11. As usual, this entails a stark simplification. One could also use a model in which the status quo is the reference point and different probabilities are attached to different amounts of vote gains (with a small probability of a very large vote gain). The important thing is to capture the main behavioral driver, however, which is why this particular example is adopted here.

12. To some extent, the different modeling approaches are interchangeable. Indeed, ignoring the loss outcomes beyond a certain point completely corresponds to adopting a utility function for losses that has no sensitivity for losses beyond that point. If one wants to adopt typical parameter values estimated in the prospect theory literature, however, such an approach would not work.

Related Articles

Use of Force in Foreign Policy

Prospect Theory in International Relations