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A psychological law of inertia and the illusion of loss aversion

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Abstract

The principle of loss aversion is thought to explain a wide range of anomalous phenomena involving tradeoffs between losses and gains. In this article, I show that the anomalies loss aversion was introduced to explain — the risky bet premium, the endowment effect, and the status-quo bias — are characterized not only by a loss/gain tradeoff, but by a tradeoff between the status-quo and change; and, that a propensity towards the status-quo in the latter tradeoff is sufficient to explain these phenomena. Moreover, I show that two basic psychological principles — (1) that motives drive behavior; and (2) that preferences tend to be fuzzy and ill-defined — imply the existence of a robust and fundamental propensity of this sort. Thus, a loss aversion principle is rendered superfluous to an account of the phenomena it was introduced to explain.

Keywords: inertia, loss aversion, endowment effect, status-quo bias, risky choice, reference-dependent preferences

An object at rest remains at rest and an object in motion remains in motion unless acted upon by an outside force.
— Newton's First Law of Motion (law of inertia)

1 Introduction

Research has shown that people tend to evaluate outcomes not in terms of their impact on an individual's resulting state of wealth, but in terms of changes from a reference state (e.g., Kahneman & Tversky, 1979). Moreover, evidence has been interpreted to imply that people are loss averse: negative changes (i.e., losses) from a reference state are thought to loom larger than positive changes (i.e., gains) of equivalent magnitude (e.g Kahneman & Tversky, 1979; Tversky & Kahneman, 1991). This principle, named loss aversion, is commonly considered the most robust and important finding of behavioral decision theory, and has been widely hailed (Camerer, 2005) and cited as a "seemingly ubiquitous phenomenon" (Novemsky & Kahneman, 2005).

This seeming ubiquity is evident in the economics and finance literature, where loss aversion has been cited, inter alia, to account for the equity premium puzzle (Benartzi & Thaler, 1995), the disposition effect (O'Dean, 1998), and the inability of risk-aversion based on wealth to explain people's unwillingness to accept small even bets (Rabin & Thaler, 2001). In the marketing literature, loss aversion has similarly been cited widely to account, inter alia, for the endowment effect (e.g., Sen & Johnson, 1997; Strahilevitz & Loewenstein, 1998), the compromise effect (Simonson & Tversky, 1992), and an observed asymmetry in the price elasticity of demand (Putler, 1992; Hardie, Johnson, & Fader, 1993).

The principle of loss aversion was first introduced by Kahneman and Tversky (1979) to account for the finding that experimental subjects required a premium over expected value to accept a bet offering an even chance of a gain or loss ("*the risky bet premium*"). Subsequently, the principle was extended to the context of riskless choice: Thaler (1980) coined the term *"endowment effect"* to refer to the finding that randomly assigned owners of an object appear to value the object more than randomly assigned non-owners of the object. For instance, in one well-known series of endowment effect experiments, Kahneman, Knetsch and Thaler (1990) found that randomly assigned owners of a mug required significantly more money to part with their possession (around $7) than randomly assigned buyers were willing to pay to acquire it (around $3). Kahneman et al. (1990, 1991) and Tversky and Kahneman (1991) attributed this result to loss aversion: owners' loss of the mug loomed larger than buyers' gain of the mug. "*The status quo bias*" — individuals' tendency to prefer to remain at the status-quo — is similarly attributed to loss aversion: It is assumed that the loss of the status-quo option looms larger than the gain of an alternative option (e.g., Kahneman et al., 1991). For instance, in one empirical demonstration of the status-quo bias, Samuelson and Zeckhauser (1988) showed that individuals participating in a hypothetical investment choice task were more likely to choose to invest

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an inheritance in a particular investment option (out of four) when that option was presented as the status-quo (i.e., when they were informed that the money from the inheritance was already invested in that option).

Remarkably for a principle that is so pervasive, the principle of loss aversion is not derived from any theory of behavior or more basic psychological principles, but is an ad hoc principle introduced to account for a range of phenomena involving tradeoffs between losses and gains that are anomalous in the context of the classical choice paradigm. The absence of an accepted psychological theory to account for loss aversion has led to a paradoxical situation: loss aversion is cited as the explanation for phenomena associated with loss/gain tradeoffs (e.g., the endowment effect, status-quo bias, risky bet premium) and, circuitously, the same phenomena are cited as evidence for the existence of loss aversion.

This is not to say that loss aversion lacks a potentially plausible psychological basis. Indeed, a number of researchers have attempted to uncover an underlying psychological mechanism that could explain a loss/gain asymmetry. Posited psychological mechanisms for loss aversion include the proposition that the hedonic impact of losses is greater than that of gains (e.g., Bar-Hillel & Neter, 1996), that people's locus of attention tends to be focused on losses more than on gains (Carmon & Ariely, 2000), and — through studies with either animals or fMRI — that a loss/gain asymmetry is cognitively hard-wired.

A common feature of these attempts to uncover a psychological mechanism for loss aversion is the premise that a fundamental loss/gain asymmetry in fact exists, and that this asymmetry is reflected in the phenomena it purports to explain. In contrast, in the present research, I do not attempt to explain the existence of a loss/gain asymmetry, but to challenge the notion that a reference-dependent asymmetry is necessary to explain these phenomena at all. In particular, I recognize that the phenomena most commonly cited as evidence for loss aversion — the status-quo bias, the endowment effect, and the risky bet premium — are characterized not only by a loss/gain tradeoff, but by a tradeoff between the status-quo and change; and, that a propensity towards the status quo in the latter tradeoff is sufficient to explain these phenomena. Moreover, I show that two basic psychological principles — (1) that motives drive behavior, and (2) that preferences tend to be fuzzy and ill-defined — imply the existence of a robust and fundamental propensity of this sort. Thus, a propensity to remain at the status-quo — i.e., inertia — is not simply an alternative account to loss aversion for these phenomena, but one that renders the introduction of a loss aversion principle superfluous.

The remainder of this article is organized as follows: First, I discuss the implication of the nature of behavior and preferences for a propensity to remain at the status-quo. Subsequently, I compare this inertia account with the loss aversion account for the status-quo bias, the endowment effect, and the risky bet premium. I conclude with the argument that the existence of a basic behavioral tendency to favor the status-quo over change renders the loss aversion principle superfluous to an account of the phenomena it was introduced to explain, and that the principle should therefore be abandoned.

2 A psychological law of inertia

In this section, I argue that a propensity to remain at the status quo, rather than a fundamental loss/gain asymmetry, offers the most parsimonious account for the phenomena loss aversion was introduced to explain. That is, a propensity to remain at the status-quo logically follows from basic, well-founded psychological principles, whereas loss aversion is an auxiliary principle, introduced ad hoc to account for seemingly anomalous phenomena.

In this section I show how psychological insights into the nature of behavior and preferences imply a robust tendency for people to remain at the status-quo in two parts: First the need for psychological motives to drive behavior implies that people will tend to remain at the status-quo when they have no clear preference between the status-quo and an alternative (or 'change') option. In addition, the fuzzy and ill-defined nature of preferences implies that people will often have unclear preferences between options, and hence, that a propensity to remain at the status quo is likely to be a robust effect.

2.1 Motive-driven behavior

In the classical choice paradigm (Von Neumann & Morgenstern, 1944) of precise and well-defined preferences, individuals making a choice between two options, A and B, are thought to either (1) prefer A to B, (2) prefer B to A, or (3) be indifferent between A and B (i.e., to prefer A and B exactly the same). A particular preference ordering is assumed to be independent of context, the description of the problem, or the procedure used to elicit the preferences. Therefore, in the classical choice paradigm, preference for A or B should be the same regardless of whether option A or option B is the status-quo option. This implies that individuals who prefer option A to option B should choose option A regardless of whether it is the status-quo option or not; and, likewise, that individuals who prefer option B to option A should choose option B regardless of whether it is the status quo option or not.

However, a question arises as to what individuals who are indifferent between Option A and Option B should do. That is, what option should be chosen by individu-

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als who have the same exact valuation for Options A and B? Although such a situation is not addressed in the economic literature, it seems clear that individuals who are indifferent between two options should choose the status quo. For instance, even in the absence of transaction costs, we should not be surprised, in the context of precise and well-defined preferences, if people "prefer" to keep the dollar in their pocket rather than exchange it for another dollar. This is because, at the most basic level, economists and psychologists alike recognize that people's behavior is directed in accordance with psychological motives (i.e., reasons, drive states, goals, incentives, etc.).

From this basic notion, it follows that people will not act to alter the status-quo unless they are impelled to do so by some motive.[1] Moreover, we can surmise that the possibility of becoming *better off* — but not *equally as well off* — can provide the necessary motive to impel people to change the status quo (see Figure 1A). This discussion is formalized as follows:

> *Psychological Law of Inertia*: A person will tend to maintain the status-quo unless impelled to alter the status-quo by a psychological motive to do so.
>
> *Corollary*: The possibility of becoming better off — but not equally as well off — can provide the necessary motive to impel a person to alter the status-quo.

As highlighted by the discussion to this point, the need for a psychological force, or motive, to alter the status-quo implies that people can be expected to manifest a preference to remain at the status-quo when they are indifferent between options. However, such an effect is unlikely to be very robust in the context of precise and well-defined preferences, because such precise preferences make the likelihood of indifference between two nonidentical options extremely slight. For instance, if an individual is indifferent between options A and B, then the classical choice assumption of monotonic preferences implies that the individual should prefer option A and a penny to option B. Thus, given a large pool of individuals, it is likely that only a minimal percentage of participants will value both options exactly the same, and these individuals will thus have only a minimal impact on any outcome that aggregates responses over this pool of individuals.

2.2 Fuzzy and ill-defined preferences

In the previous subsection, I argued that a change to the status quo requires a motive to alter the status-quo, and, accordingly, there is a tendency to remain at the status-quo when people are indifferent between options. However, I also acknowledged that the classical notion of precise and well-defined preferences implies that indifference between nonidentical options is quite rare, and thus any proclivity towards the status-quo is unlikely to be a robust effect.

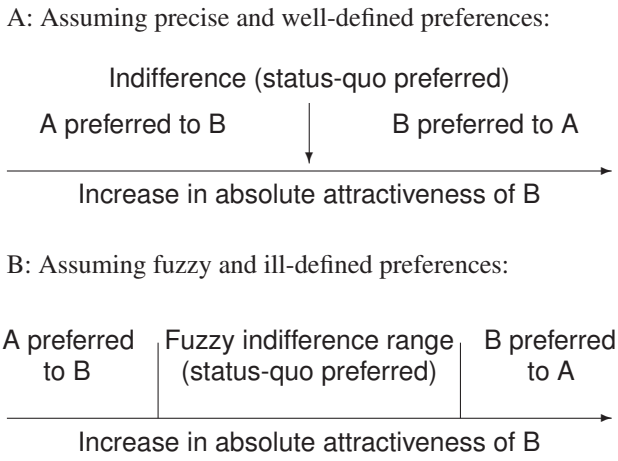

Figure 1: Relative preference for Option A over Option B with increasing absolute attractiveness of Option B.

However, in recent times, the classical notion of precise and well-defined preferences has been challenged by a great deal of evidence, which has shown that preferences tend to be fuzzy and ill defined, and that they are often constructed on an ad hoc basis (for review, see Slovic, 1995; Bettman, Luce, & Payne, 1998). Moreover, evidence suggests that people are unable to precisely assess the value of options and outcomes in an absolute sense (e.g., Hsee, 1996; Nowlis & Simonson, 1997). For instance, Kivetz and Simonson (2002) have shown that people tend to use the relative effort of others as a reference to judge the absolute amount of effort associated with a frequency reward program. More specifically, they showed that if a "deal" is relatively better for person X than for the average individual, it will be extremely attractive — to the point where it might be preferred over a dominated option. In one experiment, Kivetz and Simonson offered diners a reward program in which they could receive a free meal at a dining hall after having paid for a certain number of meals. In a between subject design, they found that sushi lovers would actually prefer a reward program which required the purchase of 10 sandwiches and 10 sushi platters to a program which required only the purchase of the 10 sandwiches. Although the former option was dominated by the latter, sushi lovers perceived a relative advantage in that they would likely have eaten the sushi anyway. Based on this *relative* advantage, sushi lovers inferred that they were getting a "bargain" in

[1] Throughout this article, "alter the status-quo" can be taken to include the similar case of "reject the default option."

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an *absolute* sense.

Research on choice deferral also suggests that people are unable to precisely judge the value of options in an absolute sense. For instance, Dhar (1997) finds that when two options are rated similarly in terms of their attractiveness, people are likely to defer choice, rather than choose one of the two options. This suggests that people are unable to precisely judge the absolute attractiveness of the options and, accordingly, do not have a precise ordering of preferences over the options that would allow them to justify choosing one option over the other.

If we extend this reasoning to a choice between any two options, A and B, then we can surmise that people may be indifferent — i.e., have no clear preference — between options A and B, *and* also have no clear preference between option A plus a penny and option B — and even between option A plus a dollar and option B. That is, fuzzy and ill-defined preferences imply a fuzzy range of *absolute* attractiveness values for option A, that are not clearly differentiated in terms of *relative* attractiveness to option B — and vice versa (see Figure 1B). For example, if option A is a monetary amount and option B is a mug, it is possible that values of A between roughly \$3 and roughly \$7 will not feel sufficiently different from the value of the mug to induce a clear preference between the monetary amount and the mug. Similarly, if option A is \$5 and option B is a mug, people may have no clear preference both between \$5 and a mug with a standard handle and between \$5 and a mug with a fancy handle — even if they strongly prefer the fancy handle relative to the standard handle.

Thus, the recognition that preferences tend to be fuzzy and ill-defined suggests that people will often have unclear preferences between two options. Accordingly, we can expect that people will often lack a motive to alter the status-quo.

3 Inertia versus loss aversion

In the previous section, I argued that the nature of behavior and preferences imply a fundamental behavioral proclivity to prefer the status-quo to change. In this section, I show that a propensity to remain at the status-quo can account for the status-quo bias, the endowment effect, and the risky bet premium — the phenomena most widely cited as evidence for loss aversion — and do so in a more logically consistent manner.

3.1 Status-quo bias and endowment effect

As discussed earlier in this article, experimental evidence has demonstrated that people have a tendency to remain at the status quo. Proponents of loss aversion assert that a status-quo propensity is a consequence of a loss/gain asymmetry (i.e., a reference-dependent asymmetry in favor of losses), whereas the proposed inertia account asserts that any such asymmetry is auxiliary to an explanation of the basic behavioral propensity to remain at the status-quo. Instead, the inertia account asserts that the status-quo bias logically follows from the basic principle that behavior is directed in accordance with psychological motives.

Clearly, the inertia account is more parsimonious than the loss aversion account; however, is there a way to also compare the descriptive validity of the inertia and loss aversion accounts as explanations for the status-quo bias? We can consider a thought experiment of the extreme case where an individual has precisely identical valuations for the status-quo option and an alternative option: would an individual exchange the dollar bill in her pocket for another, essentially identical, dollar bill absent some external motivation (e.g., a desire to comply with an experimenter's request) to do so? An inertia account predicts that, absent an external motive, an individual will "choose" to retain her dollar bill rather than exchange it for a different dollar bill because of the absence of any motive to exchange dollar bills.

In contrast, a loss aversion account makes no such prediction. This is because it is assumed (quite reasonably) that people do not typically view an exchange of identical items as a tradeoff between a loss and a gain. For instance, Kahneman (2003) has stated that loss aversion should not be expected to apply in an exchange of five \$1 bills for a \$5 bill. Similarly, Novemsky and Kahneman (2005, p. 123), in highlighting one of several proposed "boundaries of loss aversion," surmise that "[A] shopper is unlikely to experience loss aversion when giving up a good for a nearly identical one."

Although a thought experiment is likely sufficient, I conducted a simple experiment to confirm that the outcome of a choice between two essentially identical options *will* significantly favor the status-quo option (as predicted by the inertia account, but not by the loss aversion account). In a between subject design, 110 participants — undergraduates at a large west coast university — were asked to imagine that they owned a quarter minted in either Denver or Philadelphia. They were then asked whether — given a choice — they would choose to switch their coin with a coin minted in the other city, assuming insignificant time and effort involvement for the switch. Over 85% of participants in either condition chose to retain their original coin, consistent with the inertia account of the status-quo bias.

Although the experiment described above involved goods that had well-defined relative valuations (i.e., their valuations were equal), people typically do not have well-

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defined relative valuations for goods. Therefore, we can expect that there will be many pairs of options for which people will have no relative preference for one option over the other (as between two quarters) — and hence no reason or motive to alter the status-quo.

Thus, the inertia account can explain a propensity towards the status-quo both when a status-quo option and an alternative option have equivalent valuations and when they do not. Conversely, a loss aversion account is descriptively consistent with a propensity towards the status-quo in cases where the status-quo option and an alternative option are not equivalent, but it provides no insight into why such a propensity persists when option values are equivalent.

3.1.1 Endowment effect

As discussed earlier in this article, the endowment effect is the name for the finding that randomly assigned owners of an object appear to value their possession more than randomly assigned non-owners.

Because the status-quo bias and endowment effect are such similar phenomena, the logic regarding inertia as an explanation of the status-quo bias in the previous subsection extends fairly trivially to the endowment effect. For instance, using the Kahneman et al., (1990) example of buyers and sellers with divergent reservation prices for a mug, it is clear that sellers view ownership of the mug as the status-quo and non-ownership (plus receipt of payment) as the change option. For buyers, the status-quo and change options are reversed (see Figure 1B).

Moreover, when one of the two options is a variable monetary sum as in the Kahneman et al. (1990) experiments, measures of maximum willingness to pay (WTP) to acquire a good and minimum willingness to accept (WTA) to part with a good can be thought of as rough approximations to the fuzzy boundaries of the fuzzy indifference range depicted in Figure 1B. This is highlighted in Figure 2, which can be viewed as an instance of Figure 1B where option B is a variable monetary sum. WTP represents the lower boundary because at higher valuations there is either (a) indifference between the monetary sum and the good, or (b) the monetary sum is preferred to the good. Therefore, there is no motive for the individual to pay any more money for the good than the lower boundary of the fuzzy indifference range. Similar logic applies to WTA as the upper boundary of the indifference range.

One potential challenge to the inertia account of the endowment effect arises from the findings of Dubourg, Jones-Lee, and Loomes (1994). Dubourg et al. (1994) found that the gap between their experimental participants' WTP and WTA persisted even after accounting for "imprecise preferences." Specifically, Dubourg et al. attempted to define participants' WTP and WTA as confi-

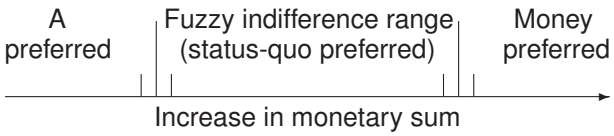

Figure 2: Relative preference for a Good A over a variable monetary sum.

dence intervals rather than as point estimates. They defined the upper end of the WTP interval as "the smallest amount a respondent definitely would *not* pay" for a good and the lower end of the WTP interval as "the largest amount a respondent definitely *would* pay." Similar elicitation procedures were used to obtain the upper and lower ends of respondents' WTA interval. Dubourg et al. hypothesized that if imprecise preferences were the source of the endowment effect, then the WTP and WTA range would overlap, but participants' point estimates of their WTP might trend toward the lower WTP bound and their point estimates of their WTA might trend toward the upper bound of the WTA interval leading to a WTP/WTA gap. Instead, they found that the entire WTP interval tended to be well below the entire WTA interval. Thus, they surmised that imprecise preferences could not wholly account for the WTP/WTA gap.

Although the notion of imprecise preferences in Dubourg et al.'s account sounds similar to the notion that people often lack clear relative preferences between options, the manner in which Dubourg et al. operationalize a range of imprecise preferences does not equate to the fuzzy indifference range described by the inertia account. Indeed, the inertia account *predicts* that measures of WTP should be below measures of WTA because it is the gap between WTP and WTA that represents the fuzzy indifference range (i.e., the range over which people do not have a clear preference for the money or the good and hence do not trade due to the absence of a motive to trade.) Dubourg et al.'s use of different elicitation methods to obtain a range for each of WTP and WTA merely demonstrates that the *borders* of the indifference range should not be thought of as clear demarcations between indifference and a clear preference for one option over another, but as fuzzy and imprecise. Accordingly, different elicitation methods of WTP and WTA should be expected to yield different values for the borders of the fuzzy indifference range. This is highlighted by the short lines on either side of the long line in Figure 2. The short lines represent possible ranges for WTP and WTA as found by Dubourg et al. (1994), whereas the long lines between them represent particular point estimates of WTP and WTA.

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3.1.2 Degree of preference clarity

Although the principle of loss aversion is agnostic about the magnitude of the loss aversion coefficient (Daniel Kahneman, personal communication, 2004), several researchers have sought to address this question empirically. In general, most researchers have concluded that the "coefficient of loss aversion" is somewhere around 2 (e.g., Tversky & Kahneman, 1992). However, other researchers have found that the degree of loss aversion depends on the degree of similarity between options being evaluated. For instance, unlike in the quarters experiment presented earlier in this section, Chapman (1998) found that a majority of experimental participants *were* willing to trade items that they owned for identical items. Moreover, Chapman showed that participants were more willing to trade identical items than similar items and similar items than dissimilar items. However, Chapman was able to obtain these results only when she offered participants a nickel for the act of trading in order to cover participants' "transaction costs."

The inertia account introduced in this article provides insight into this finding whereas the loss aversion account is silent. Specifically, the requirement for an incentive — in the form of a nickel — to induce transactions for identical and similar items is in accord with the inertia account. When items being traded are identical or very similar, relative preferences are well-defined — i.e., there is a relatively narrow range of absolute values of the options over which there is no clear preference between the options (i.e., a narrow indifference range in Figure 1B) — and hence, even a slight increase in the value of the alternative option (e.g., an extra nickel) will be a sufficient enough incentive for participants to alter the status-quo.

In other words, a participant asked to trade item X for item X will have no motive to do so; however a participant asked to trade item X for item X + 5 cents can recognize that item X + 5 cents is clearly better than item X, and hence has a motive to execute the trade (absent transaction costs). On the other hand, if a participant has no clear preference between two dissimilar items, X and Y, then she is also unlikely to have a clear preference between item X + 5 cents and item Y (see Figure 1B), and therefore is likely to lack a motive to alter the status-quo with or without a nickel incentive.

3.1.3 Do people like the status-quo?

In recent research, Moshinsky and Bar-Hillel (2005) found that participants tended to evaluate public policy options more favorably when they were presented as the status-quo option than when they were not, a phenomenon they dubbed, the "status-quo label bias." Moshinksy and Bar-Hillel (2005) argued that this finding constituted support for loss aversion. This is an interesting assertion, because it is diametrically opposed to the findings and arguments of Loewenstein and Kahneman (1991) and Kahneman et al. (1991). Loewenstein and Kahneman (1991) found that despite the persistence of an endowment effect, experimental participants did not rate the attractiveness of endowed options more favorably than the same options when they were not endowed. Kahneman et al. (1991) interpreted this finding to imply that the endowment effect does not "enhance the appeal of the good one owns, only the pain of giving it up." Thus, while the status-quo label bias may be — under certain circumstances — a complimentary contributor to a status-quo bias, evidence for a status-quo label bias does not appear to support the loss aversion account over the inertia account of the status-quo bias.

3.2 Risky bet premium

The status-quo bias and endowment effect phenomena involve a loss/gain tradeoff that is entangled with a status-quo/change tradeoff. That is, the status-quo option is always associated with potential loss, whereas the change option is always associated with potential gain.

At first inspection, the risky bet premium phenomenon does not appear to involve a status-quo/change tradeoff. There appears to be only a tradeoff between the potential for loss associated with taking the bet and the potential for gain associated with taking the bet. However, upon closer inspection, the risky bet premium phenomenon is actually quite similar to the endowment effect and status-quo bias phenomena. In particular, in deciding whether to accept a single risky bet, the status-quo option is *not taking* the bet, whereas the change option is *taking* the bet. That is, the decision to accept a single risky bet can be thought of as a choice between two options, A and B, where Option A is not taking the bet (i.e., the status-quo) and Option B is taking the bet (i.e., the change option). This is depicted in Figure 3, which can be viewed as an instance of Figure 1B where option A is the status-quo and Option B is the status-quo plus a risky bet.

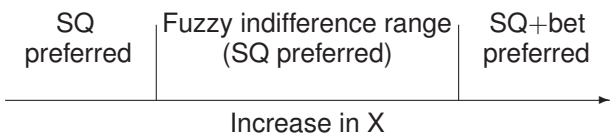

Figure 3: Relative preference for status-quo (SQ) over SQ plus a risky bet with 50% chance of losing $c and 50% chance of Winning $X.

The loss aversion account of the risky bet premium ignores the status-quo/change tradeoff. It asserts that people demand a premium over expected value to accept an

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even bet because the potential for loss associated with taking the bet looms larger than the potential for gain associated with taking the bet. This, of course, is premised on the belief that, objectively, people should judge the value of risky prospects according to their expected value (e.g., Arrow, 1965).

In reality, however, this presumption is a simplification made so that risky prospects can be incorporated into rational (i.e., mathematical) theories of choice. There is, in fact, no demonstrably objective formula by which people should judge risky prospects. Instead, people should judge risky prospects according to their goals: they should weigh their desire to avoid potential loss against their desire to acquire potential gains according to their preference for the tradeoff between them.

However, because this preference is likely to be fuzzy and ill-defined, there is likely to be a fuzzy range of values for a prospect for which people will not have a clear preference between the prospect and the status-quo. For instance, people may have no clear preference between the status-quo and a prospect featuring a 50% chance of losing $100 and a 50% chance of gaining $100; and, they may also not have a clear preference between the status quo and a 50% chance of losing $100 and a 50% chance of gaining $150. That is, they may not have a clear sense that either bet, on balance, will tend to make them *better off* than not taking the bet. Thus, people are likely to demand a premium to accept an even bet when they have no preexisting psychological motive to alter the status-quo.

To distinguish these competing accounts, I conducted a simple experiment, where participants faced a choice between risky prospects that featured a tradeoff between potential loss and potential gain, but *no* clear tradeoff between the status-quo and change. Specifically, experimental participants (133 undergraduates at a large west coast university) were asked to allocate a hypothetical monetary sum between a risk-free ("safe") option and an even bet. The problem featured no clear tradeoff between the status quo and change because the problem featured no clear status-quo option. The problem appeared as follows:[2]

Allocation Task:

Assume you have $100 that you want to invest and that the available options are the two investment options below. How would you allocate your money between the 2 options?

Investment Option A

You will make 3% on your investment for sure.

Investment Option B

You will double your investment with a 50% chance.
You will lose your investment with a 50% chance.

Of my $100, I would invest $___ in Option A
and $___ in Option B.

After a series of unrelated tasks, participants were also asked — as in previous risky bet premium experiments — to indicate the premium they would require to accept a single risky bet. The problem appeared as follows:

Single Risky Bet Task:

Suppose you were offered a risky bet that offered a **50%** chance of **losing $100** and a **50%** chance of **winning X**. What is the least X would have to be for you to be willing to take this bet?

X would have to be $___.

3.2.1 Results

In the single risky bet task — consistent with prior findings — less than 2% of participants were willing to accept an even bet, and the rest tended to require a significant premium to accept the bet (median value of X was $500).

In contrast, in the allocation task, 23% of participants allocated the entire monetary sum to the 'even bet' option, 55% of participants allocated some of the monetary sum to the 'even bet' option and some to the 'safe' option, and only 23% of participants allocated the entire monetary sum to the 'safe' option. Thus, the results of these two tasks showed a robust requirement for a premium to accept an even bet *only* when participants were faced with a status-quo/change tradeoff (i.e., in the single risky bet task). Indeed, this is the first experiment to show that a large percentage of experimental participants — nearly 80% — are willing to accept an even bet, a finding which challenges the most basic prediction of loss aversion (i.e., that people are unwilling to accept even bets.)

3.2.2 Discussion

The results of this experiment show that people demand a premium over expected value to accept a single bet with even odds of a gain or loss, but do not necessarily demand such a premium when allocating funds across assets with different levels of risk (i.e., in a task with greater ecological validity). At first blush, one concern is that the allocation task may have prompted a demand effect, whereby participants assumed that the task was intended to elicit allocations to both of the options. However, the finding that nearly half of participants allocated the entire monetary sum to a single option, and that of those participants,

[2]The problem was the first of six investment allocation type problems and participants were asked to assume that the duration of the investment in each problem was one year.

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half allocated the entire sum to the risky option, suggests that demand effects cannot explain the large share of funds allocated to the risky option.

Another initial concern is that the sums participants were asked to allocate were small. It is possible that participants would have allocated a greater share of the monetary sum to the safe option had participants been asked to allocate a sum that constituted a larger share of their budgets or wealth. However, risky bet premium experiments are typically conducted with small sums of money, because it has been recognized that larger sums will lead to an increasing impact of wealth, budgets and other classical economic variables on participants' decision making (e.g., Kahneman & Tversky, 1979). Indeed, Rabin and Thaler (2001) argue that it is the fact that people are so risk averse with such small sums of money that provides the greatest support for the existence of loss aversion. Thus, the findings of this experiment are *highly inconsistent* with the loss aversion account, but consistent with the proposed inertia account of the risky bet premium.

However, the fact that the evidence from this experiment is consistent with the inertia account does not imply that the evidence *strongly* supports the inertia account. I have argued that the main difference between the allocation task and the single risky bet task is the absence of a clear status-quo option — and hence of a tradeoff between the status-quo and change — in the allocation task. An alternative account, however, is that the manipulations between tasks (e.g., temporal distance and choice vs. willingness-to-pay) simply led to a dramatic shift in risk preference between tasks: participants were risk-seeking in the allocation tasks and, a few minutes later, dramatically risk-averse in the single risky bet task.

However, such a dramatic change in risk preference between tasks seems implausible. Moreover, despite the superficial difference in risk preference expressed by participants across tasks — i.e., "risk-seeking" in the allocation task and "risk-averse" in the single risky bet task — there was a correlation in the decisions participants made between tasks. Those participants who required the highest premiums in the single risky bet task (based on a median split) tended to allocate a greater part of their hypothetical monetary sum (64% vs. 46%) to the safe option in the allocation task ($t(131) = 2.71$; $p < 0.01$). Thus, it would appear that participants were, in fact, expressing a real and relatively consistent underlying preference for risk — i.e., for the tradeoff between potential loss and potential gain — across tasks, but that this preference was being systematically shifted by an influence unrelated to risk preference: a propensity to remain at the status quo in the single risky bet task, but not in the allocation task.

4 Does loss aversion exist?

So far, in this article, I have argued that the notion that motives drive behavior — together with the fuzzy and ill-defined nature of preferences — necessarily implies a basic behavioral tendency to remain at the status-quo, without the need for any other auxiliary principle. I have also shown that this basic behavioral tendency is sufficient for explaining the existence of a status-quo bias, an endowment effect, and a risky bet premium, and that it provides a more logically consistent account for these phenomena than loss aversion.

Given this inertia account, what are the implications for the existence of loss aversion? To be sure, the existence of inertia does not *preclude* the possibility that other influences also contribute to the complex phenomena investigated in this article. Among those factors are anticipated regret, locus of attention, and the status-quo label bias. Other research, however, casts further doubt on the existence of a fundamental loss/gain asymmetry by challenging the evidence for loss aversion in phenomena that involve a loss/gain tradeoff but *not* a status-quo/change tradeoff. For instance, the equity premium puzzle — the finding that historical returns on stocks have significantly exceeded those on bonds (beyond what could be explained by simple risk aversion) — has previously been cited as evidence for loss aversion (Benartzi & Thaler, 1995). However, Fama and French (2002) noted that using historical data on returns alone is not very meaningful for judging the forward-looking equity premium — i.e., the returns investors could reasonably have expected at the time. Fama and French (2002) estimated the forward-looking equity premium to be substantially smaller than the realized equity premium, obviating the need for a loss aversion explanation.[3] Similarly, the scanner panel data finding by Hardie et al. (1993) that demand is more elastic for price increases than for price decreases was challenged by a study by Bell and Lattin (2000), who found no such asymmetry after controlling for the confounding influence of heterogeneity in consumer price responsiveness.[4]

Even this evidence cannot *disprove* the existence of loss aversion; but, the inability of researchers to find evidence for loss aversion in these phenomena and its dispensability to an account of the phenomena it was introduced to explain — as highlighted by this article — do suggest that its existence may well be moot. An analogy from cosmological physics serves to highlight this point. At the end of the nineteenth and start of the twentieth centuries cosmology faced an anomaly: Maxwell's equations of electromagnetism required that light travel

[3] Arnott and Bernstein (2002) estimated that the forward looking equity premium at the time of their study was zero or even negative

[4] I thank Jim Lattin for reviewing this point.

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at a constant rate, but Newtonian mechanics required all motion to be relative. Hence, to resolve this anomaly, physicists posited the existence of a 'luminiferous ether,' a universal substance in space; light was thus thought to move relative to the ether. Then, in 1905, Einstein's theory of special relativity showed that if time was not fixed — an observation subsequently confirmed by empirical evidence — the presence of an ether was no longer required. Thus, relativity did not preclude the existence of the ether, but it did render its existence superfluous to an explanation of the phenomenon it was introduced to explain. Accordingly, the concept of an ether was abandoned.

Analogously, a basic behavioral tendency to remain at the status quo does not disprove the existence of a fundamental loss/gain asymmetry, but it does render its existence superfluous to an account of the phenomena it was introduced to explain. Indeed, given the fuzzy and ill-defined nature of preferences, and the need for a motive to drive behavior, we should be surprised if we did *not* observe a status-quo bias, an endowment effect, and a risky bet premium. Therefore, like the ether, logic dictates that the principle of loss aversion be abandoned.[5]

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[5] Abandoning loss aversion does not imply abandoning other elements of Prospect Theory's value function. None of the arguments made in this article in any way challenge the separate coding of losses and gains around a reference point, the concavity of the value function in the domain of gains, or the convexity of the value function in the domain of losses. This article merely challenges the notion that the loss and gain curves are asymmetric (i.e., steeper in the domain of losses than in the domain of gains).

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