

The Loss of Loss Aversion: Will It Loom Larger Than Its Gain?

David Gal
University of Illinois at Chicago

Derek D. Rucker
Northwestern University

Accepted by Sharon Shavitt, Associate Editor

Loss aversion, the principle that losses loom larger than gains, is among the most widely accepted ideas in the social sciences. The first part of this article introduces and discusses the construct of loss aversion. The second part of this article reviews evidence in support of loss aversion. The upshot of this review is that current evidence does not support that losses, on balance, tend to be any more impactful than gains. The third part of this article aims to address the question of why acceptance of loss aversion as a general principle remains pervasive and persistent among social scientists, including consumer psychologists, despite evidence to the contrary. This analysis aims to connect the persistence of a belief in loss aversion to more general ideas about belief acceptance and persistence in science. The final part of the article discusses how a more contextualized perspective of the relative impact of losses versus gains can open new areas of inquiry that are squarely in the domain of consumer psychology.

Keywords Loss aversion; Sociology of science

One of us polled approximately 80 people present for a conference session on consumer decision making at the 2016 Society for Judgment and Decision Making Conference in Boston. The question posed was simple: Which of the following do you believe?

- A Losses loom larger than gains
- B Gains loom larger than losses
- C Losses and gains have similar psychological impact

All but three participants raised their hands to indicate they believed that losses loom larger than gains. Not a single person indicated a belief that gains loom larger than losses. And, only three participants indicated a belief that losses and gains have roughly similar psychological impact. To put this observation in context, this occurred at a session where participants were made aware the topic of the talk was to challenge the notion that losses generally loom larger than gains. Similarly, at talks and conversations with colleagues at multiple universities

we have encountered near unanimous support for the premise that losses loom larger than gains.

Although anecdotal, we view these examples as illustrations of the near universal acceptance among social scientists of *loss aversion*—the idea that losses loom larger than equivalent magnitude gains. The expression “loom larger” is used to indicate that losses are experienced with greater psychological impact. For example, an extrapolation from loss aversion is that the loss of \$5 is more painful than the gain of \$5 is pleasurable. Loss aversion is a central idea of Prospect Theory (Kahneman & Tversky, 1979), a set of connected ideas initially intended to provide a descriptive model of behavior in the context of risky choice. Kahneman and Tversky’s (1979) paper is the most cited paper in all of economics and the third most cited paper in psychology (Simonsohn, 2014).

Although prospect theory contains ideas besides loss aversion, in his Nobel Prize biography, Kahneman wrote that, “the concept of loss aversion was, I believe, our most useful contribution to the study of decision making” (Kahneman, 2003). More recently, Kahneman (2011) wrote, “The concept of loss aversion is certainly the most significant contribution of psychology to behavioral economics” (p. 300). As further illustration of the importance attributed to loss aversion, in a paper that outlines

Received 20 March 2018; accepted 20 March 2018

Available online 30 March 2018

The authors gratefully acknowledge helpful comments from Eric Anderson, Jonathan Baron, Bobby Calder, Blake McShane, Brian Sternthal, Christian Wheeler, and Eldad Yechiam. We also thank the editor, Sharon Shavitt, for feedback and guidance.

Correspondence concerning this article should be addressed to David Gal, University of Illinois at Chicago, 601 S. Morgan St, Chicago, IL 60607, USA. Electronic mail may be sent to davidgal@uic.edu.

© 2018 Society for Consumer Psychology
All rights reserved. 1057-7408/2018/1532-7663
DOI: 10.1002/jcpy.1047

the practical value of prospect theory, loss aversion was cited in 5 of 10 examples where prospect theory could be observed in the real world (Camerer, 2000). Additional evidence for the widespread acceptance of loss aversion is the official announcement of Matthew Rabin's receipt of the John Bates Clark Medal awarded to the best economist under 40. The award committee cited his work that supported loss aversion as a primary basis for the award (American Economic Association, 2001; see also Camerer & Thaler, 2003).

Loss aversion is cited widely across the social sciences in law, medical decision making, political science, marketing, finance, consumer psychology, and many other areas, and has even entered the popular lexicon (Lewis, 2016). It has been cited as an explanation for many well-known phenomena, such as the compromise effect (Simonson & Tversky, 1992), the disposition effect (Odean, 1998), the default effect (Johnson & Goldstein, 2003), and the equity premium puzzle (i.e., Benartzi & Thaler, 1995). It has been celebrated ("Three Cheers—Psychological, Theoretical, Empirical—for Loss Aversion"; Camerer, 2005), recognized as a "seemingly ubiquitous phenomenon" (Novemsky & Kahneman, 2005), and described as "one of the most fundamental and well-documented biases in information processing. . ." (Rozin & Royzman, 2001, p. 306).

Here, we offer a review and discussion of the literature on loss aversion. Our main conclusion is that the weight of the evidence does not support a general tendency for losses to be more psychologically impactful than gains (i.e., loss aversion). Rather, our review suggests the need for a more contextualized perspective whereby losses sometimes loom larger than gains, sometimes losses and gains have similar psychological impact, and sometimes gains loom larger than losses. In other words, the choice presented at the beginning of this article is a false one as it denied the audience the possibility of a contextual perspective. Rather, the question should have offered a fourth option: all of the above are true depending on the context.

The remainder of this article is partitioned into four parts. In the first part, we discuss, in more detail, what loss aversion is. In the second part, we consider the evidence on the relative impact of losses versus gains. A review of the evidence challenges the idea that losses fundamentally loom larger than gains, and thus challenges the idea of loss aversion as a generalizable principle. In the third part, we aim to address the question of why the acceptance of loss aversion remains persistent and pervasive among social scientists. In the fourth part,

we recommend the adoption of a contextual perspective as a means to develop a better understanding of the psychological processes associated with losses and gains and suggest directions for future research.

Part 1: Understanding What Loss Aversion Is

Put simply, loss aversion suggests that losses are experienced with greater psychological force than gains of similar magnitude. Along these lines, it has been argued that "losses hurt about twice as much as gains make us feel good" (p. 137; Thaler, 2000). Importantly, losses and gains are defined in terms of changes from what individuals subjectively perceive as a neutral reference point (e.g., the status quo). For example, one individual who obtained \$5 might view the \$5 as a gain, whereas another individual that expected to obtain \$10, but only obtained \$5, might view the \$5 obtained as a loss of \$5 relative to his expectation (Kahneman & Tversky, 1979).

Two aspects of loss aversion are particularly noteworthy. First, most writings on loss aversion assume it to be a fundamental and generalizable principle rather than contextual in nature. Second, loss aversion is atypical for a psychological principle in that it is defined without regard to a specific psychological process; it describes rather than explains behavior. Both of these points merit additional discussion to properly appreciate the construct of loss aversion.

On the first point, loss aversion has been represented as a fundamental principle. Loss aversion is not understood as the idea that losses *can* or *sometimes* loom larger than gains, but that losses inherently, perhaps inescapably, outweigh gains. For example, Kahneman, Knetsch, and Thaler (1990, p. 1326) describe loss aversion as "the generalization that losses are weighted substantially more than objectively commensurate gains." In a similar fashion, other researchers do not qualify the idea of loss aversion; Tversky and Kahneman (1986, p. S255) state that "the response to losses is more extreme than the response to gains"; and Kahneman and Tversky (1984, p. 342) state "the value function is. . . considerably steeper for losses than for gains."

This observation is not to say that researchers who accept loss aversion as a generalized principle are so narrow as to explicitly state that loss aversion is universal. Yet, as noted, it is often the case that efforts are not undertaken to qualify loss

aversion or explicitly state, for instance, that circumstances and psychological processes exist that lead losses and gains to have similar psychological impact, or that lead gains to loom larger than losses. Indeed, even when researchers who accept loss aversion discuss “boundaries of loss aversion,” they tend to reinforce and anchor on the basic idea that losses have fundamentally greater impact than gains.

As an illustrative example, Novemsky and Kahneman (2005), in an article titled, “The Boundaries of Loss Aversion,” focus on the idea that “goods that are given up as intended do not exhibit loss aversion” (p. 119). However, the authors’ explanation is that individuals do not code goods that are exchanged “as intended” in terms of losses and gains; for example, they discuss that money spent as intended “is not evaluated as a loss” (p. 124). In other words, their boundary condition is not one where people perceive a loss to be of equivalent magnitude to a gain, but a case where no losses are perceived. Thus, it is not a boundary condition of loss aversion per se. Similarly, in a comment on Novemsky and Kahneman (2005) titled “When Do Losses Loom Larger than Gains,” Ariely, Huber, and Wertenbroch (2005) do not challenge the universality of the idea that losses fundamentally loom larger than gains, but suggest possible moderators of the degree of loss aversion. Put simply, most writings on loss aversion appear to accept the assumption that losses do loom larger than gains and deviations from this are aberrations and violations of the norm that do not challenge the basic principle.

As further support for this observation, research that introduces moderators of effects taken as evidence of loss aversion (e.g., the status quo bias) is not viewed as evidence against, nor a challenge to, loss aversion. Rather, these moderators have been viewed as additional factors that might affect particular phenomena above and beyond loss aversion. For example, Chernev (2004) found that goal orientation affected the degree of the status quo bias, and speculated that some factors “could potentially override loss aversion effects” (p. 564). Chernev, thus, concludes that “the preference for the status quo can occur independently of loss aversion” (p. 557). Again, the presence of loss aversion itself is not challenged, but it is acknowledged that other factors might act in an opposite direction in a given context.

A second aspect of loss aversion that stands out is that loss aversion is defined as a descriptive as opposed to an explanatory principle. That is, loss

aversion was explicitly introduced as a means to describe rather than to explain behavior. To illustrate, prospect theory, of which loss aversion is a key parameter, has been described by its progenitors as a “descriptive model of choice” (Tversky & Kahneman, 1986, p. S255). Thaler elaborates on this notion and states that “Descriptive theories try to characterize actual choices. Prospect theory is an example of a descriptive theory” (p. 138, Thaler, 2000). As such, loss aversion is defined independent of any specific psychological process account for what causes it. Despite this, researchers use loss aversion to explain phenomena (Camerer, 2004), and those same phenomena tend to be proffered as evidence of loss aversion (Camerer, 2006). For example, the endowment effect, described shortly, is cited as evidence of loss aversion, and loss aversion is cited as an explanation for the endowment effect (Thaler, 1980).

In short, loss aversion has been regarded as a fundamental principle whereby losses loom larger than gains, and it is thought to characterize human behavior. We next provide a critical review of the evidence for this idea.

Part 2: Evidence for Loss Aversion

What would we expect to observe if loss aversion is a general psychological principle? To us, this depends on how loss aversion is defined. Here, we consider two possible forms of loss aversion.

A first form—that we refer to as the strong version for exposition purposes—is that losses inherently loom larger than gains and, as such, one should observe that losses exert greater psychological impact than gains *and* gains never exert greater psychological impact than losses. This strong version does not require that losses must outweigh gains in all circumstances, as factors such as measurement error and boundary conditions might obscure or reduce the fundamental propensity for losses to be weighted more than equivalent gains. However, to accept the strong version of loss aversion, one should not observe cases where gains have a propensity to be weighted more than losses of similar magnitude.

A second form of loss aversion as a general principle—that we label as the weak version—is that losses, on balance, loom larger than gains. Unlike the strong version of loss aversion, this weaker version allows for the idea that people can show a greater response to gains or propensity to be “gain seeking” in some contexts. However, the

weak version is supported if, on average, one expects the data would largely reveal a greater impact of losses than of gains. If neither of these hypotheses were supported, one would have to question the viability of loss aversion as a general and fundamental principle and instead consider a third possibility that the relative psychological impact of losses and gains of similar magnitude can vary based on contextual factors that influence the relative strength of psychological processes associated with losses and gains.

In this section, we review the evidence for loss aversion from a variety of contexts, which include riskless choice, risky choice, ratings of the relative hedonic impact of losses versus gains, real-world phenomena, and message framing (see Table 1 for summary). We also review phenomena sometimes cited as evidence for loss aversion, but that do not, in fact, involve a comparison of the relative impact of losses versus gains. Finally, we end with a discussion of the evidence for both weak and strong versions of loss aversion as a general principle.

Riskless Choice

Status quo bias. The status quo bias, the name given for individuals' propensity to prefer the status quo to an alternative option, has been attributed to loss aversion (Kahneman, Knetsch, & Thaler, 1991) and thus taken as evidence supportive of loss aversion. In particular, the loss aversion account suggests that the loss of the status quo option looms larger than the gain of an alternative (change) option. However, Ritov and Baron (1992) provided evidence that the status quo bias was not a propensity to remain at the status quo per se, but a propensity to favor inaction over action (i.e., omission over commission).

In particular, Ritov and Baron showed that when presented with a choice that involved the option to do nothing or to do something, people tended to choose to do nothing; this decision resulted in a tendency toward the choice of the status quo option when doing nothing maintained the status quo, but a tendency toward the choice of the change option when doing nothing resulted in a change from the status quo. Others have found that a propensity toward the status quo sometimes persists even when action is required to maintain the status quo (Schweitzer, 1994), though Ritov and Baron (1992) did not find this to be the case.

Regardless, acceptance of the idea that individuals tend to favor inaction over action (rather than to favor the status quo over change per se) does not

preclude the loss aversion explanation for the status quo bias. Instead, this observation merely qualifies the loss aversion explanation: if loss aversion explains the status quo bias, then the reference point must be inaction (i.e., the default situation of doing nothing) rather than the status quo. In other words, it is not the loss of the status quo that looms larger than the gain of the alternative; rather what is to be lost by action looms larger than what is to be gained by action.

At the same time, a propensity toward inaction does not, by any means, require loss aversion. Gal (2006)'s inertia account states that when people are indifferent between options, they should favor inaction over action because doing something requires a psychological motive. Alternatively, a preference for inaction might occur because individuals will tend to favor options that reduce processing and transaction costs. Other explanations for a propensity toward inaction are that errors of commission tend to involve greater regret than errors of omission (Ritov & Baron, 1995) and that individuals might rely on an "if ain't broke, don't fix it" heuristic (alluded to by Baron & Ritov, 1994).

To illustrate that loss aversion is not required to explain the status quo bias, Gal (2006) asked participants if they would trade one good (a quarter minted in Denver) for an essentially identical good (a quarter minted in Philadelphia). Kahneman (2011) has noted that loss aversion does not come into play when individuals exchange essentially identical goods (e.g., when trading one \$5 bill for five \$1 bills) because people do not code such exchanges in terms of losses and gains. Nonetheless, Gal (2006) found that more than 85% chose to retain their original quarter. We recently replicated this result by asking 149 MTurk participants whether they would prefer to trade a \$20 bill they were slated to receive for another \$20 bill (i.e., the change option) or to stick with the original \$20 bill they were slated to receive (the status quo option). In one version, participants were only able to choose between these two options, whereas in another version, participants were able to indicate that they were indifferent between the options. Although, according to Kahneman (2011), loss aversion should not come into play in this context because the exchange would not be coded in terms of losses and gains, we observed a clear tendency of participants to indicate a preference for the status quo option (see Figure 1). Thus, again, the presence of a status quo bias should not be viewed as evidence of loss aversion.

In sum, the mere presence of a status quo bias (or inaction bias) does not provide insight into

Table 1
Paradigms Cited as Evidence for Loss Aversion and Inferential Concerns

Paradigm/ Effect	Example	Reason paradigm/effect is taken as evidence for loss aversion	Inferential concerns with evidence as support- ive of loss aversion
Status quo bias	Kahneman et al. (1991)	Individuals show a tendency to stick with the status quo. The loss of the status quo is thought to loom larger than the gain of a change option	Loss and gain are confounded with inaction and action; when losses and gains are decoupled from inaction and action in the retention paradigm, no evidence for loss aversion is present (Gal & Rucker, 2017a). In addition, the status quo bias occurs even when the status quo and change options are otherwise equivalent and thus not coded in terms of losses and gains (Gal, 2006; replicated in this article)
Endowment effect	Kahneman et al. (1990)	Participants indicate a higher WTA than WTP for the same good	Loss and gain are confounded with inaction and action as well as other factors. When losses and gains are decoupled from inaction and action in the retention paradigm, no evidence for loss aversion is present (Gal & Rucker, 2017a; see also Isoni, 2011; Yechiam et al., 2017; Weaver & Frederick, 2012)
Risky bet premium	Tversky & Kahneman (1992)	Participants demand a substantial premium over an expected value of zero to accept a bet with even odds of gain and loss. It is thought that the possible loss of money looms larger than the possible gain of money	Inaction and action are confounded with loss and gain; when losses and gains are decoupled from inaction and action, no evidence for loss aversion is present (Ert & Erev, 2013; Gal, 2006; Yechiam & Hochman, 2013)
Hedonic impact ratings	McGraw et al. (2010)	Participants rated losses more emotionally impactful than gains when both were rated jointly with respect to each other	Subsequent research has shown this effect reverses for small stakes (Mukherjee et al., 2017). In addition, for small and moderate stakes, losses are not rated to be more impactful than gains when losses and gains are not evaluated jointly with respect to each other (Gal & Rucker, 2017b; Harinck et al., 2007). Moreover, in the case of large stakes, loss aversion cannot be distinguished from risk aversion
Sunk cost effect	Arkes & Blumer (1985)	People do not want to recognize losses	The effect does not compare losses to gains so does not ultimately speak to the presence or absence of loss aversion
Price elasticity	Hardie et al. (1993)	Demand appears more sensitive to price increases than to price decreases	A greater impact of price increases relative to price decreases is not consistently observed when consumer price response heterogeneity is controlled for (Bell & Lattin, 2000; Mazumdar & Papatla, 2000); nor is such an asymmetry observed in experimental contexts (Mukherjee et al., 2017; experiments 3a, 3b)
Equity risk premium	Benartzi & Thaler (1995)	Underinvestment in stocks relative to bonds implies an implausible level of risk aversion	A number of other plausible explanations have been offered to explain the equity risk premium that do not require loss aversion (e.g., Constantinides et al., 2002; Fama & French, 2002)
Disposition effect	Odean (1998)	People sell stocks that have gained value too soon and hold on to stocks that have lost value too long	The disposition effect can be explained by the reflection effect or a belief in mean reversion

Table 1
Continued

Paradigm/ Effect	Example	Reason paradigm/effect is taken as evidence for loss aversion	Inferential concerns with evidence as support- ive of loss aversion
Loss/Gain framing	Rozin & Royzman (2001)	Loss-framed appeals have different effects on behavior than gain-framed appeals	Greater risk seeking in loss frames compared to gain frames can be explained by the reflection effect (Tversky & Kahneman, 1981); meta-analyses do not support the conclusion that loss frames are generally more impactful than gain frames, and in fact, the opposite might be true (O'Keefe & Jensen, 2007)

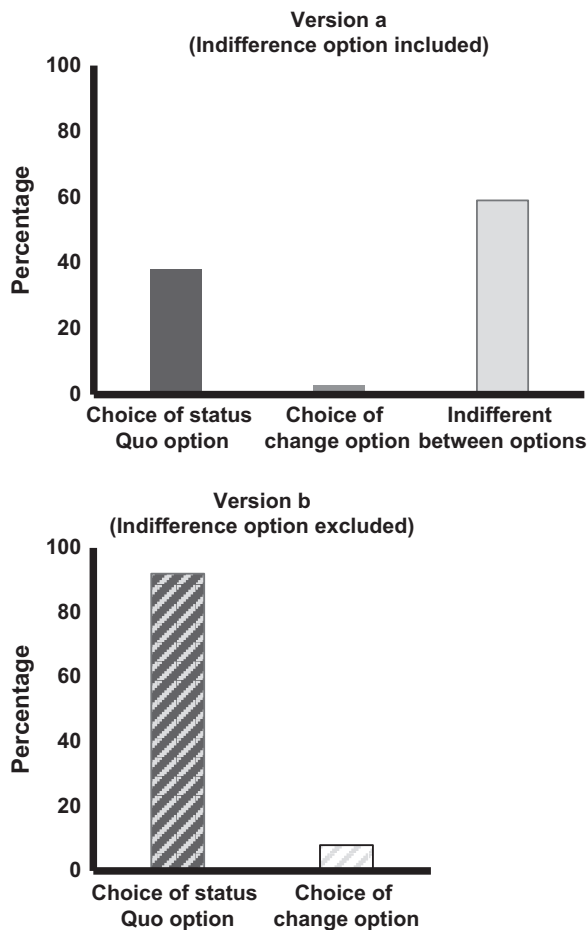


Figure 1. Status quo bias in the absence of loss/gain coding: participants' choice between otherwise identical status quo and change options.

Note. $n = 149$; Version A and Version B were shown within-subject; Version A was shown before Version B for all participants.

whether losses loom larger than gains. The status quo bias might be caused by the loss of the status quo looming larger than the gain of an alternative, but it might equally be caused by any of a number

of other factors that lead toward a propensity toward inaction (and/or a propensity toward the status quo). As such, the presence of a status quo bias, in and of itself, cannot be taken as tantamount to evidence for loss aversion.

The endowment effect. The endowment effect is the phenomenon perhaps most often cited as evidence for loss aversion in the context of riskless choice (Kahneman et al., 1990; Thaler, 1980; Tversky & Kahneman, 1991). The endowment effect refers to the finding that owners of an object demand more to part with the object than nonowners are willing to pay to obtain it (Thaler, 1980). For example, in a classic study, Kahneman et al. (1990) found that individuals endowed with a mug demanded, on average, about \$7 to part with it. In contrast, individuals not endowed with a mug were, on average, willing to pay only about \$3 to obtain the same mug. The finding that individuals' willingness to accept (WTA) is greater than their willingness to pay (WTP) appears robust across many different instantiations of the endowment paradigm (Kahneman et al., 1991). It is this central finding that is viewed as evidence for the general principle that losses exert a greater impact than gains.

Although taken as evidence for loss aversion, the endowment effect can be understood as a case of the status quo bias where maintaining the endowed option is the inaction (or status quo) alternative. As such, the endowment effect is subject to the same alternative explanations (e.g., inertia) to loss aversion as those described for the status quo bias. For example, the inertia explanation suggests that when individuals are indifferent between the endowed option and the nonendowed option, they will opt to maintain the endowed option due to lack of incentive to trade, not because the loss of the endowed option looms larger than the gain of the nonendowed option.

Another explanation of the endowment effect, which similarly does not require loss aversion, comes from Weaver and Frederick (2012) and Isoni (2011) (see also Simonson & Drolet, 2004; Yechiam, Ashby, & Pachur, 2017). These authors provide a differential reference price account. They argue that buyers and sellers face fundamentally different decisions that lead them to focus on different reference prices when setting WTP and WTA amounts, respectively. For buyers, their own personal utility from the acquisition of the object is the most salient reference. In contrast, for sellers, the market value of the object is the most salient reference. As a consequence, if market prices tend to exceed personal valuations, owners will ask more for a product than a prospective buyer is willing to pay. For example, if both owners and nonowners value an object at \$3, but the market price is \$7, owners will demand \$7 to part with it, whereas nonowners will only be willing to pay \$3 to acquire it. This account, as with inertia, requires no differential sensitivity to losses to explain the endowment effect.

Other potential confounds exist in the endowment effect paradigm. For example, WTP and WTA are assessed on different scales. WTP is bounded by one's ability to pay (i.e., budget constraints), whereas WTA is not.

In the possible alternative explanations to loss aversion for the endowment effect discussed so far, the valuation of an option when it is the endowed versus the nonendowed option does not differ. However, research also shows that individuals confronted with the decision of whether to give up an endowed option tend to focus more on positive features and less on negative features of the option than those faced with the decision of whether to acquire the option (Carmon & Ariely, 2000; Nayakankuppam & Mishra, 2005; see also Johnson, Haubl, & Keinan, 2007). This process could result in greater valuation for an option when it is endowed than when it is not endowed and, therefore, could be interpreted as a process that leads losses to loom larger gains in the context of the endowment effect. However, two caveats are in order. First, because loss and gain are confounded with inaction and action in the endowment paradigm, rather than reflect a tendency to elevate the option that might be lost, this process could just as well reflect a tendency to elevate the inaction alternative. Second, even if one accepts the idea that a tendency exists to elevate options that might be lost in the context of the endowment effect, it would not imply acceptance of loss aversion itself; that is, the acceptance of a general principle whereby losses

loom larger than gains. In particular, to accept a general principle of loss aversion would, at the least, require evidence that losses loom larger than gains across different contexts, including in contexts where losses and gains are not confounded with inaction and action.

Retention paradigm. Gal and Rucker (2017a) have made a recent effort to address the limitations of the classic status quo bias/endowment paradigms to offer an alternative test of whether losses loom larger than gains and, thus, of loss aversion. Specifically, Gal and Rucker (2017a) developed the retention paradigm, which decouples decisions about losses and gains from decisions about inaction and action. The retention paradigm involves a comparison of participants' WTP to obtain an object (WTP-Obtain) to a condition where participants are asked their maximum willingness-to-pay to *retain* an object they own (WTP-Retain). The retention paradigm and its core feature—the WTP-retain condition—proposes to offer a less confounded test of the relative impact of losses versus gains.

First, a comparison between individuals' WTP-Retain to WTP-Obtain decouples decisions about losses and gains from decisions about inaction and action because the default outcome in both the WTP-Retain and WTP-Obtain condition is held constant across conditions; if participants take no action they will not possess the good. In other words, in both conditions participants need to act in order to end up with the good. Moreover, a comparison of WTP-Retain to WTP-Obtain eliminates the differential reference prices confound (Isoni, 2011; Weaver & Frederick, 2012); both those in the WTP-Retain and WTP-Obtain condition should consider their utility from ownership. Third, the retention paradigm eliminates potential differences in response scales as WTP-Retain and WTP-Obtain are similarly bounded by one's ability to pay.

What if, per loss aversion, losses fundamentally loom larger than gains? The prediction for the retention paradigm is clear. Individuals should exhibit greater concern with the loss of an object than the acquisition of the identical object. As such, people should pay more in the WTP-Retain condition (i.e., when a loss looms) as opposed to the WTP-Obtain condition (i.e., when a gain looms). To support the strong version of loss aversion, WTP-Retain should be reliably greater than WTP-Obtain and circumstances should not be observed where people indicate a greater WTP-Obtain compared with WTP-Retain. To support the weak version of loss aversion, the retention paradigm should at least yield results that, on balance, find that

WTP-Retain exceeds WTP-Obtain. In contrast, if WTP-Retain and WTP-Obtain are consistently similar, this outcome would challenge loss aversion as a general principle. And, if WTP-Obtain were to regularly exceed WTP-Retain, this outcome would be evidence for people being “gain seeking.”

A question that might arise is why anyone would pay to keep what they already have? Indeed, a caveat in applying the retention paradigm is that scenarios need to be designed so that individuals assigned to the WTP-Retain condition (a) construe the transaction in terms of paying to avoid a loss and (b) perceive the transaction as fair. Gal and Rucker (2017a) did this through operationalizing the retention condition in a number of ways, including WTP to repair a broken phone (vs. WTP to obtain a repaired phone in the WTP-Obtain condition), willingness to expend time to drive to obtain an accidentally left behind unused, new-condition notebook (vs. willingness to expend driving time to obtain a new notebook at no financial cost), and willingness to pay to retain services. In the case of services, there is no factual ownership, but individuals can still construe losing a service as a loss. For example, if one’s Internet service expires at the end of a month, its loss is likely to be construed as a loss even though one does not have indefinite ownership rights to the service.

Gal and Rucker (2017a) find across multiple experiments with a wide range of objects (e.g., mugs and notebooks; mobile phones; high-speed Internet, and train services) that WTP-Retain did not typically exceed WTP-Obtain. In fact, in most cases, little difference between WTP-Retain and WTP-Obtain was observed, and for mundane goods, WTP-Obtain exceeded WTP-Retain more often than not. For example, participants reported that they were willing to pay more per month to obtain fiber optic Internet service (\$50.43) than they were willing to pay to retain fiber optic Internet service that they already had ($M = \$43.75$). Of importance, Gal and Rucker also find that participants encoded WTP-Retain as a loss and WTP-Obtain as a gain in their experiments. For example, in the fiber optic Internet service scenario, 85% of participants in the WTP-Retain condition reported that they thought about their decision in terms of avoiding a loss, whereas only 9% of participants in the WTP-Obtain condition reported that they thought about their decision in terms of a loss.

Thus, the retention paradigm, which is designed to offer an alternative and more valid test of loss aversion than existing paradigms, finds little support for the idea that a general propensity exists for

losses to loom larger than gains. Therefore, results obtained using the retention paradigm, along with alternative explanations for the status quo bias/endowment paradigms, challenge the idea of a general tendency of losses to loom larger than gains in the context of riskless choice.

Discrete retention paradigm. In an alternate, discrete version of the endowment paradigm, rather than stating a valuation, individuals are simply offered a choice between whether they would prefer to keep an endowed option or exchange it for an alternative, nonendowed option. Prior research finds that individuals are significantly more likely to select an option when it is the endowed option than when it is the nonendowed option (Kahneman et al., 1991). That is, they are more likely to choose to keep an option when it is the endowed option than to trade for that same option when it is the nonendowed option. People’s preference to keep the endowed option is taken as evidence of loss aversion. However, a limitation of this paradigm is that, like the nondiscrete variant of the endowment paradigm, loss and gain are confounded with inaction and action.

We developed a discrete retention paradigm that decouples decisions about loss and gain from decisions about inaction and action (Gal & Rucker, 2017a). In this paradigm, retaining the endowed option is framed as an active choice rather than as the inaction alternative. That is, in the discrete variant of the retention paradigm, both the decision to retain one’s endowed option and the decision to exchange the endowed option for an alternative are framed as action alternatives. In particular, participants in one condition are informed that they own one good and are asked which of two options they would prefer, either (a) receiving \$0 [i.e., the retention option], or (b) exchanging their endowed good for an alternative good. Participants in a second condition are offered the same choice except the endowed good and the alternative good are swapped. Loss aversion predicts that individuals should be more inclined to prefer a good when it is the endowed than when it is the nonendowed option. That is, for a given good, the share choosing a specified good should be higher when it is the endowed option than when it is the alternative option.

We ran the paradigm with two different hypothetical scenarios with 182 participants. In one scenario, participants were endowed with either a pen or a chocolate bar and had to choose whether to switch to the alternate good. In the second, participants were endowed with either \$5 or a mug that

featured the logo of their favorite sports team and had to choose whether to switch to the alternate good. In both scenarios, the share choosing a good was essentially identical whether it was the endowed option or whether it was the nonendowed option. For example, in the scenario in which individuals had to choose between a mug and \$5, the mug was chosen 26% of the time both when it was the endowed option and when it was the nonendowed option. In other words, in the condition where the mug was the endowed option, participants chose option A (receiving \$0) 26% of the time; in the condition where the mug was the nonendowed option, participants chose option B (exchanging their \$5 for the mug) 26% of the time.

Of note, when we ran the discrete variant of the endowment paradigm with the same stimuli and population, we replicated the typical pattern of results. For example, participants chose the mug 41% of the time when it was the endowed option, but only 18% of the time when it was the nonendowed option (in a follow-up study, we ran the discrete retention paradigm and discrete endowment paradigm in the same study and replicated the pattern of results). Thus, in contrast to the predictions of loss aversion, which should hold across both paradigms, a simple procedural change that decoupled loss and gain from inaction and action eliminated the preference for an endowed option.

Risky Choice

Kahneman and Tversky (1979) propose that individuals will tend to demand a substantial premium over an expected value of zero to accept a bet with even odds of winning and losing the bet. In the words of Kahneman and Tversky (1979), “most people find symmetrical bets of the form $(x, 0.50; -x, 0.50)$ distinctly unattractive.” In a typical demonstration, which we refer to as *the risky bet premium paradigm*, if individuals are offered a bet with a 50% chance of losing \$5 and a 50% chance of winning X , on average, they demand that X be \$10 or more in order to accept the bet. This finding is assumed to reflect the greater perceived psychological impact of a loss compared with a gain (Tversky & Kahneman, 1992).

Gal (2006) points out that the risky bet premium can be conceived as a special case of the status quo bias paradigm where not accepting the bet is the status quo (or inaction) option and accepting the bet is the change (or action) option. As a result, similar explanations to those that can explain the status quo bias and endowment effect can explain

the risky bet premium. Therefore, it is unclear whether the risky bet premium reflects a general tendency of losses to loom larger than gains or reflects processes associated with a propensity to favor inaction over action.

In order to decouple losses and gains from inaction and action in the context of risky choice, Gal (2006) presented participants with a risky bet, where no difference in action or inaction existed with respect to accepting the bet and not accepting the bet. Gal found no evidence that losses loomed larger than gains. Specifically, in a hypothetical decision to allocate funds (\$100) between a safe alternative that returned 3% for sure and a mixed even bet with an expected return of zero, nearly 80% of individuals allocated at least some funds to the even bet, that is, to a risky option with *lower* expected value than the safe option, and approximately 20% of individuals allocated all the funds to the even bet, an amount which matched the percentage of individuals allocating all their funds to the safe option.

Rather than evidence for loss aversion, if anything, the behavior documented by Gal (2006) appears, on net, to reflect gain seeking. Other researchers have similarly found that when given multiple investment options, individuals tend to choose risky investment options over safer investment options with higher expected value (Ben-Zion, Erev, Haruvy, & Shavit, 2010). Such findings appear difficult to reconcile with a general principle of loss aversion (see also Erev, Ert, & Roth, 2010; Sonsino, Erev, & Gilat, 2002 for results with similar implications) and provide evidence against both the strong and weak versions of loss aversion considered here.

Other researchers have found that when accepting a risky bet is not framed as the sole action option, but as one option in a choice between two action options, no evidence for loss aversion emerges (Erev, Ert, & Yechiam, 2008; Ert & Erev, 2013; Ert & Yechiam, 2010; Hochman & Yechiam, 2011; Koritzky & Yechiam, 2010; Yechiam & Ert, 2007). For example, Erev et al. (2008) offered participants a choice between either (a) receiving 0 points for sure or (b) receiving a bet that offered a 50% chance to win 1000 points and a 50% chance to lose 1000 points (points were to be converted to money at a known ratio). Erev et al. found that 48% of participants chose the safe option (i.e., receiving 0 point for sure) and 52% of participants chose the risky option. Consistent with this finding, a review of over 30 papers finds little evidence that losses loom larger than gains in the context of risky choice

when a bet with even odds of gaining and losing is not framed as the action option (Yechiam & Hochman, 2013). We recently found additional support for this conclusion in two separate runs of an experiment conducted with participants from MTurk. In particular, we asked participants to imagine they faced a choice between either (a) receiving \$0 with 100% chance or (b) receiving \$15 with 50% chance or losing \$15 with 50% chance. In both runs, participants exhibited a trend toward the choice of the risky option (Figure 2). Thus, we did not find evidence for participants to avoid loss any more than they pursued gain in risky choice.

The stakes of the outcomes in risky choice experiments that do not show evidence for loss aversion tend to be low to moderate (from less than \$1 to as high as \$100). Conversely, some experiments that involve higher stakes (e.g., several hundred dollars) have shown a tendency among individuals to choose the safer alternative. However, loss aversion is assumed to be independent of the level of the stakes involved (Kahneman & Tversky, 1979). In fact, that the effects attributed to loss aversion have been found with small stakes is cited as particularly strong evidence for loss aversion (Rabin, 2003; Rabin & Thaler, 2001). The reason scholars have focused on small stakes is because avoidance of large magnitude losses can be explained by ordinary risk aversion for changes in wealth/circumstances, which is entirely consistent with rational choice theory, whereas the same is not true of avoidance of low stakes losses that do not materially impact wealth/circumstances. For example, it is rational to perceive a greater impact from losing \$1000 that is needed to pay the rent than from gaining \$1000 when basic needs are already covered. Conversely, if neither losing nor gaining \$5 materially changes one's circumstances, it can be viewed as irrational to view its loss as more impactful than its gain. Thus, the finding that people often exhibit risk neutrality in choices among low-stakes mixed gambles is evidence against loss aversion.

Other findings that examine how people make choices among bets also reveal findings inconsistent with loss aversion. For example, studies show that, within a reasonably wide range, people do not prefer even bets with smaller magnitudes of potential losses and gains to bets with larger magnitudes of potential losses and gains (Erev et al., 2008; Ert & Erev, 2013; Hochman & Yechiam, 2011; Katz, 1964). Katz (1964) found that in a choice between (a) a bet that offered a 50% chance of winning 1 point and a 50% change of losing 1 point, and (b) a bet that offered a 50% chance of winning 4 points and a

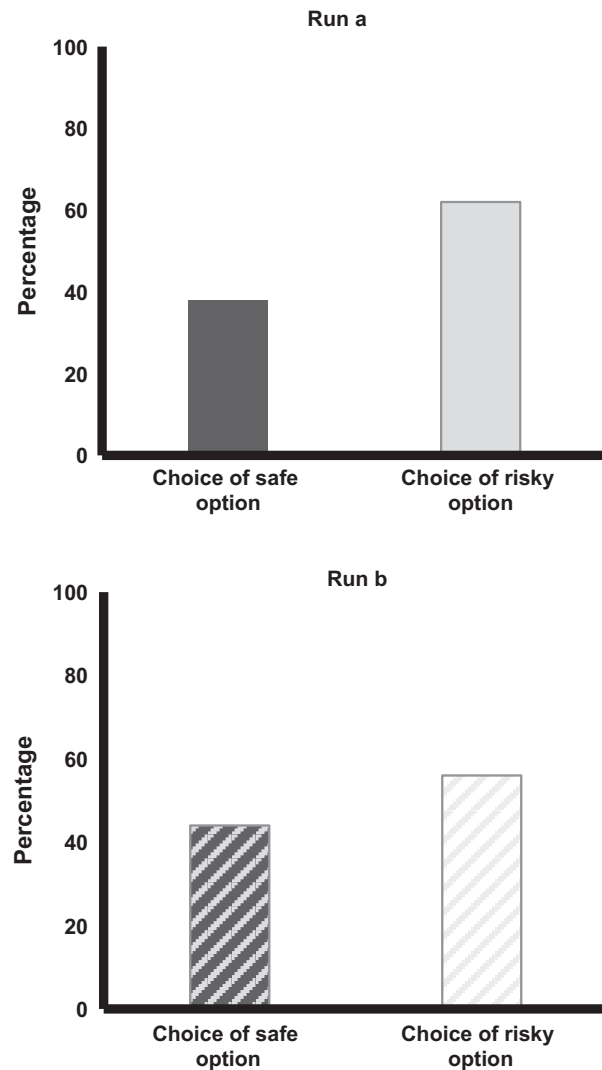


Figure 2. Participants' choice between safe and risky alternative in two runs.

Note. $n = 60$ for Run A, $n = 77$ for Run B.

50% chance of losing 4 points, just 49% of participants chose the lower stakes bet. This is inconsistent with the idea of loss aversion that predicts that individuals should be more motivated to avoid the larger potential loss. Likewise, contrary to the predictions of loss aversion, research shows that individuals are no less-risk averse when choosing between different potential gains (e.g., choose between (a) gaining 1000 points for sure or (b) a bet with even odds of gaining either 0 or 2000 points) than when choosing among options where one of the choices involves potential for loss (e.g., choose between (a) receiving 0 points for sure or (b) a bet with even odds of losing 1000 points or gaining 1000 points; Erev et al., 2008).

In a review of the evidence for loss aversion in the context of risky choice, Ert and Erev (2013) conclude that, “[Loss aversion] is not general: there are many situations in which people exhibit risk neutrality in choice among low stakes mixed gambles” (Ert & Erev, 2013; p. 227). And Yechiam and Hochman (2013) conclude that “in decisions under risk and uncertainty losses are not reliably avoided” (p. 506). In sum, as in the case of riskless choice, little support for the idea of loss aversion in the context of risky choice, in either its strong or weak versions, is present.

Ratings of the Impact of Losses versus Gains

Arguably, perhaps the most straightforward test of loss aversion is to simply ask people to evaluate the impact of losing versus gaining the same object. However, when researchers have examined how people rate the impact of losing versus gaining the same amount of money, little support for loss aversion has emerged (Harinck, Van Dijk, Van Beest, & Mersmann, 2007; Liberman, Idson, & Higgins, 2005; Mellers, Schwartz, & Ritov, 1999; Mukherjee, Sahay, Pammi, & Srinivasan, 2017; Rozin & Royzman, 2001). For example, Rozin and Royzman (2001) write: “In its boldest form, losing \$10 is worse than winning \$10 is good. Although we are convinced of the general validity of loss aversion, and the prospect function that describes and predicts it, we confess that the phenomenon is only realizable in some frameworks. In particular, strict loss and gain of money does not reliably demonstrate loss aversion (unpublished data by the authors)” (Rozin & Royzman, 2001, p. 306). In fact, with low stakes, gains actually appear to loom larger than losses when using this paradigm (e.g., Harinck et al., 2007).

Whereas past work has focused on a comparison between losing versus gaining monetary amounts, we have recently examined how people react to losing nonmonetary objects (Gal & Rucker, 2017b). For example, how do people rate the impact of losing versus gaining a mug? For most everyday objects we examined (mugs, flashlights, notebooks), the positive impact anticipated from gaining the object was rated to be greater than the negative impact anticipated from losing the object. For example, using a scale ranging from -5 (“extremely negative”) to $+5$ (“extremely positive”) to describe their feelings, participants who rated their feelings about losing a mug said their feelings would be less affected ($M = 1.38$) than did participants who rated their feelings if they were to gain a mug ($M = 2.71$).

Notably, for some objects, we found no statistical difference between the impact of gains versus losses (a watch, a mountain view, lakefront access), and for no object did we find losses were rated to be more impactful than gains.

McGraw, Larsen, Kahneman, and Schkade (2010) attempted to reconcile the inconsistency of such findings with loss aversion. Specifically, the authors proposed that losses and gains are evaluated on different subjective scales. Consequently, the comparison of the impact of a loss evaluated independently with the impact of a gain evaluated independently does not provide a fair relative comparison of the impact of losses versus gains. Instead, they argue for a fair comparison, the loss and gain of an object need to be evaluated jointly with respect to each other. To this end, McGraw et al. (2010) asked participants to evaluate the relative impact of losing versus gaining the same amount of money; for example, they asked participants which of losing or gaining \$50 they thought would be more impactful. With this approach, McGraw et al. (2010) identified a pattern of results consistent with loss aversion: the majority of participants stated that the loss of money would be more impactful than its gain.

McGraw et al. (2010) provide one methodological approach that might be potentially useful to assess the psychological impact of losses versus gains. At the same time, one can question whether their methodology introduces new methodological problems, such as susceptibility of their approach to participants’ lay theories regarding the relative impact of losses and gains. Regardless, with respect to how this work fits with the overall evidence for loss aversion, an important caveat is in order. Namely, the studies of McGraw et al. (2010) involved potentially significant amounts of money for the participants involved (i.e., \$50 and \$200 for undergraduates). As noted previously, when large amounts of money are involved, loss aversion is indistinguishable from risk aversion for changes in wealth, which is fully consistent with rational choice theory (cf. Rabin & Thaler, 2001). To put this in context, if losing \$50 is more likely to impact one’s lifestyle and wellbeing than gaining \$50 is likely to impact it, then it is perfectly rational that individuals would be more psychologically impacted by losing \$50 than by gaining \$50. However, it is assumed that the loss versus gain of small amounts of money do not differentially impact one’s objective wellbeing, and hence, it is considered irrational for losses to loom larger than gains

when small amounts of money are involved (Rabin & Thaler, 2001).

Indeed, in a recent paper by Mukherjee et al. (2017), the authors replicated the procedure of McGraw et al. (2010) with low stakes. They observed that when stakes were low, gains were rated as having *more* psychological impact than losses. Conversely, when stakes were high, Mukherjee et al. (2017) found that participants tended to rate losses as more impactful than gains. Thus, consistent with the possibility of contextual factors affecting the relative impact of losses and gains, the findings of Mukherjee et al. suggest a moderator of when losses loom larger than gains. On the other hand, the definitiveness of this moderator must be tempered by potential concerns about the validity of the particular methodology used for testing the impact of losses versus gains and the fact that for high stakes it is difficult to distinguish risk aversion from differences in the psychological impact of losses and gains. Finally, in recent work (Gal & Rucker, 2017b), we also asked participants to rate the impact of gaining and losing various goods using McGraw et al.'s procedure. Although our results varied based on the nature of the good, we found no evidence for a predominance for losses to loom larger than gains.

Real-World Phenomena

A number of real-world phenomena have been documented that are viewed as supportive of the idea of loss aversion. We review some of the most highly cited and discussed here.

Hardie, Johnson, and Fader (1993) reported greater demand elasticity—or the size of consumers' response—to price increases than to price decreases. This finding is viewed as supportive of loss aversion because consumers are presumed to interpret price increases as a loss and price decreases as a gain. However, in subsequent work, Bell and Lattin (2000) found little evidence for a general asymmetry in the response of demand to increases versus decreases in price after controlling for heterogeneity in consumer price responsiveness (see also Mazumdar & Papatla, 2000). Further, in an experimental context with hypothetical choices, Mukherjee et al. (2017, experiment 3a, 3b) did not find that individuals reported being more impacted by price increases than by price decreases that ranged from less than 1% to around 10% of the reference price.

Another phenomenon used to support the idea of loss aversion, known as the *equity premium*

puzzle, is the tendency for people to underinvest in stocks relative to bonds based on their risk-reward tradeoffs (Benartzi & Thaler, 1995). In particular, stocks are riskier than bonds, but have historically provided excess returns compared to bonds, such that underinvestment in stocks relative to bonds implies an implausible level of risk aversion. However, loss aversion is just one of many possible accounts put forth to explain this (Aiyagari & Gertler, 1991; Bansal & Yaron, 2004; Constantinides, 1990; Constantinides, Donaldson, & Mehra, 2002; Rietz, 1988), and others have argued that it is not a puzzle at all (Fama & French, 2002). Specifically, Fama and French (2002) note that the relatively high realized returns of stocks relative to bonds over the time period in which the equity premium was observed were not necessarily expected a priori. As such, it cannot be claimed that investors underinvested relative to known risk-reward tradeoffs.

Moreover, whereas real-world phenomena exist that appear consistent with loss aversion, as pointed out by Ert and Erev (2013), other phenomena occur that appear consistent with the opposite, namely gain seeking. For example, Barber and Odean (1999) identified the phenomenon of overtrading in the stock market, whereby investors trade more than would be justified by rationality assumptions. To the extent that maintaining the status quo is thought to represent loss aversion, this excess trading (i.e., changing of the status quo) could be interpreted to support gain-seeking behavior. Further, individual investors exhibit insufficient diversification among assets (Barber & Odean, 2000). To the extent that diversification reduces risk, this behavior can also be interpreted as gain seeking. In sum, though often cited as evidence for loss aversion, when examined in light of the broader literature, evidence from real-world phenomena provides little support for loss aversion.

Message Framing

To the extent that losses loom larger than gains, one might expect loss-framed appeals to be more effective than gain-framed appeals (Levin, Schneider, & Gaeth, 1998). However, the evidence from the work on message framing does not appear to support either a weak or strong version of loss aversion. In a meta-analysis of 93 studies involving over 20,000 participants in health-related messaging contexts, O'Keefe and Jensen (2007) did not find a single context where loss-framed appeals had

statistically greater persuasive power than gain-framed appeals. Interestingly, gain-framed appeals were actually found to be statistically more persuasive than loss-framed appeals in disease-prevention messages.

Phenomena That Do Not Involve Comparing Losses to Gains

A number of phenomena that are sometimes attributed to loss aversion do not, in fact, involve comparison of the relative magnitude of losses versus gains, and thus do not provide a test of loss aversion. For example, the well-known Asian Disease problem (Tversky & Kahneman, 1981), whereby people are more likely to take a risk to avoid the loss of lives than to take a risk to save the same lives, is sometimes attributed to loss aversion (e.g., Rozin & Royzman, 2001, p. 307). However, this phenomenon manifests the *reflection effect* whereby people tend to be risk seeking in the domain of losses and risk averse in the domain of gains (Tversky & Kahneman, 1981, p. 454). To elaborate, a feature of prospect theory, distinct from loss aversion, is that people exhibit diminishing sensitivity to increasing magnitude of both losses and gains (Kahneman & Tversky, 1979). As a result, when individuals are in the loss domain (i.e., they have already accepted some degree of loss), losing even more does not feel as impactful as reducing their losses, leading them to be risk seeking. Conversely, when individuals are in the gain domain, gaining even more does not feel as impactful as reducing their gains, leading them to be risk averse.

Similarly, the *disposition effect*, the name for the tendency of individual investors to hold on to stock market losers and to sell stock market winners, is often attributed to loss aversion (Odean, 1998). However, it too can be explained by the reflection effect or, alternatively, by lay beliefs about mean reversion. Finally, other effects that involve losses are sometimes attributed to loss aversion even though they do not even involve the comparison of a loss with a gain. For example, the *sunk cost effect*, a greater tendency to continue an endeavor once an investment in money, effort, or time has been made, is often attributed to loss aversion (Arkes & Blumer, 1985). However, the sunk cost effect appears to simply reflect a reluctance to recognize losses, not a greater impact of losses relative to gains (i.e., loss aversion) since no comparison to a gain is made.

Summary

In sum, an evaluation of the literature suggests little evidence to support loss aversion as a general principle. This appears true regardless of whether one represents loss aversion in the strong or weak forms presented here. That is, a strong form suggests that, for loss aversion to be taken as a general principle, one should observe losses to generally outweigh gains and for gains to never outweigh losses. The weak form, as we have represented it, might simply be that, on balance, it is more common for losses to loom larger than gains than vice versa. This is not to say that losses *never* loom larger than gains. Yes, contexts exist for which losses might have more psychological impact than gains. But, so do contexts and stimuli exist where gains have more impact than losses, and where losses and gains have similar impact. This observation from the literature suggests a contextual perspective to the study of losses and gains is required, which we will turn to shortly.

Part 3: The Sociology of Loss Aversion

We regard the persistent and pervasive acceptance of loss aversion, despite the contrary evidence, to be an interesting sociological phenomenon. Indeed, it is perhaps fitting that loss aversion benefits from a form of status quo bias that has resisted competing ideas. Here, we consider why acceptance of loss aversion is such a persistent belief among researchers and relate it to broader views of belief persistence among scientists. In particular, we focus on the idea that loss aversion has become the scientific consensus, which is inherently resistant to change. In addition, we discuss the idea that loss aversion has significant intuitive appeal and that it might also reflect a tendency to overgeneralize.

Scientific Consensus

Kuhn's (1962) *Structure of Scientific Revolutions* is a seminal work that examined the nature and evolution of scientific belief. Kuhn viewed science as a fundamentally social process that defines scientific truth through consensus. According to Kuhn, evidence is evaluated in light of the subjective worldview or set of *received beliefs* that scientists accept at a given time.

Kuhn (1962) defines *normal science* as "research firmly based upon one or more past scientific achievements, achievements that some particular

scientific community acknowledges for a time as supplying the foundation for its further practice" (Kuhn, 1962, p. 10). Kuhn (1962) terms these achievements as paradigms and argues that for them to be adopted by a scientific community they must be both unprecedented in order to attract a group of adherents from other areas of scientific inquiry and open-ended in order to leave questions for researchers to pursue and thereby to build upon the paradigm. He further argues that paradigms are essential in bounding a discipline and defining the important research questions.

How does a paradigm become accepted? Kuhn (1962) argues that "paradigms gain their status because they are more successful than their competitors in solving a few problems that the group of practitioners has come to recognize as acute" (Kuhn, 1962, p. 23). Prospect Theory (Kahneman & Tversky, 1979), of which loss aversion is a key principle, fits this mold. It became established because it presented a model that accounted for important anomalies to the rational choice assumption that individuals' decisions will reflect a preference for maximizing expected value (viz., the Allais paradox, Allais, 1953; the reflection effect, Markowitz, 1952; overweighting of low probability events, Friedman & Savage, 1948; and loss aversion, Samuelson, 1963; see Erev, Ert, Plonsky, Cohen, & Cohen, 2017 for review). Indeed, the challenge and alternative prospect theory presented to rational choice theory has often been represented in Kuhnian terms (see Rabin, 2002).

Similar to the way Kuhn describes the qualities that lead to acceptance of a new paradigm, prospect theory was viewed as both sufficiently unprecedented and sufficiently open-ended to attract a community of scientific adherents to build upon the model. Prominent adherents spanned many fields and included Richard Thaler, Colin Camerer, Duncan Luce, Max Bazerman, George Loewenstein, and Elke Weber (Simonsohn, 2014). Moreover, prospect theory introduced new and important experimental paradigms that produced interesting and robust results, such as the endowment effect.

Kuhn (1962) argues that key activities of normal science are (a) gathering facts relevant to the paradigm (e.g., through experiments), (b) matching the facts to the predictions of the paradigm, and (c) further articulation of the paradigm. Normal science is thus "an attempt to force nature into the preformed and relatively inflexible box that the paradigm supplies" (p. 25). At the same time, little effort is focused on the identification of anomalies, and to

the extent that anomalies are discovered, they tend to be unnoticed, dismissed, or ignored. In fact, Kuhn (1962) notes that much of paradigm-based research is confirmatory, aimed at uncovering what the researcher already believes to be true, and therefore suffers from confirmation bias (see also Greenwald, Pratkanis, Leippe, & Baumgardner, 1986). One consequence is that articles that confirm the theory are published and cited, whereas those that do not are not published or are ignored. In this autocatalytic manner, a paradigm becomes increasingly entrenched as the consensus of the scientific community.

We can see this pattern with the manner in which the scientific literature developed around prospect theory, in general, and loss aversion, in particular. Many research articles were published devoted to collecting data relevant to the paradigm (e.g., Thaler, 1980), to matching data to the paradigm (e.g., Benartzi & Thaler, 1995; Hardie et al., 1993), and to further articulating the paradigm (e.g., Novemsky & Kahneman, 2005; Tversky & Kahneman, 1992). Consistent with the idea that evidence has tended to be viewed through the lens of the paradigm, evidence in support of loss aversion has received significant attention, whereas contrary evidence has tended to be ignored. For example, in 2016, an article by Hardie et al. (1993), which supports the predictions of loss aversion, received 65 Google Scholar citations, whereas a paper by Bell and Lattin (2000), which challenges the interpretation of Hardie et al. (1993), received only 14 Google Scholar citations. As another example, even phenomena that do not involve comparisons of the relative impact of losses and gains have been attributed to loss aversion (e.g., Arkes & Blumer, 1985).

Kuhn (1962) argues that as a paradigm becomes entrenched, it increasingly resists change. When an anomaly is ultimately identified that cannot easily be ignored, scientists will try to tweak their models rather than upend the paradigm. They "will devise numerous articulations and ad hoc modifications of their theory in order to eliminate any apparent conflict" (Kuhn, 1970, p. 78).

We can view such attempts to modify or tweak the articulation of loss aversion, or to add additional parameters, in response to robust and, at face value, inconvenient facts for the notion that losses loom larger than gains (Conslisk, 1993; McGraw et al., 2010; Novemsky & Kahneman, 2005; Prelec & Loewenstein, 1991). For example, McGraw et al. (2010) argued that ratings of the impact of losses and gains failed to demonstrate loss aversion

because people tend to evaluate losses and gains on different subjective scales; Novemsky and Kahneman (2005) attempted to reconcile loss aversion with the observation that people buy and sell goods all the time with the notion that there is no loss aversion for goods traded “as intended”; and Conlisk (1993) attempts to reconcile loss aversion with evidence that people often make bets and play the lottery with the idea that gambling has consumption value (see also Prelec & Loewenstein, 1991). This is not to say that the approach of any of these scholars is inherently wrong or unproductive. We believe they have revealed insights about the difficulties of comparing losses to gains, about how goods traded as intended are evaluated differently from goods not so traded, and about the consumption value of gambling. Nonetheless, we believe these approaches also reveal, as described by Kuhn, scientists gravitating toward tweaking and upholding an accepted paradigm rather than toward questioning its fundamental basis in the face of contradictory evidence.

In sum, Kuhn’s (1970) ideas on how scientific ideas become entrenched and, thereby, resist change might help to explain how acceptance of loss aversion as a generalized principle has persisted despite the contrary evidence.

Intuitive Appeal and Overgeneralization

Loss aversion’s hold on the minds of scientists may also derive from the intrinsic resonance of the idea. Though research warns against it, people’s beliefs tend to follow their intuition (Nisbett & Wilson, 1977).

Indeed, many historically sticky scientific ideas were probably significantly more intuitive than the ideas that superseded them. For example, the geocentric theory of the universe (i.e., the idea that the earth is the center of the universe) likely felt natural to humans seeking to perceive their existence as meaningful. Likewise, the miasma theory of disease, that is, the idea that disease was caused by “bad air,” might have felt more intuitive than the idea that diseases were caused by microbes invisible to the naked eye. Other superseded theories, including the Lamarckian theory of inheritance (i.e., that organisms pass on characteristics to their offspring that they acquire in life), the luminiferous ether (i.e., the idea that a substance rather than sheer emptiness permeates space), and the phlogiston theory of matter (i.e., that a particular substance is part of combustible items and is released during combustion), likely also had greater intuitive appeal

in their time than the theories that superseded them.

With respect to the intuitive appeal of loss aversion, a deep resonance may exist with the idea that a negative change in life circumstances is acutely felt. Indeed, Kahneman (2011) notes that the idea of loss aversion “surprises no one except perhaps some economists,” (p. 304) and that “Amos [Tversky] and I often joked that we were engaged in studying a subject about which our grandmothers knew a great deal” (p. 300). However, even if this intuition is true in some cases, it would not imply that it is true in all cases. That is to say, just because the relative impact of losses is greater than that of gains in one context does not imply that it is the case in all contexts. Nonetheless, historic examples suggest that scientists often overgeneralize, favoring grand, overarching theories that explain a vast array of different phenomena through a single cause (Wiarda, 2010). For example, behaviorism took the idea that some behavior is conditioned and extrapolated it to encompass all behavior (Chomsky, 1959).

Another likely reason for the intuitive appeal of loss aversion is that most individuals can probably relate to cases where losing something is quite painful, seemingly more so than gaining something. For example, one of us recently spent \$2000 to save the family dog from a life-threatening intestinal blockage. The dog is a mutt saved from a rescue shelter and the owner would not have paid \$2000 to acquire the dog in the first place. However, now he has become beloved by the family. While such examples of acutely felt losses might contribute to the intuitive appeal of loss aversion, they do not, in fact, represent loss aversion. This is because people become attached to certain objects (or pets) that they own and thereby value them more than they had or would have prior to attachment; this is quite different from the idea of loss aversion which is that people are more impacted by losses than by gains simply because they lie on different sides of a neutral reference point.

In general, it can be stated that the name “loss aversion” represents exceptional branding from the perspective of enhancing the idea’s intuitive appeal as everyone is essentially averse to losses (just as everyone is attracted to gains). This good branding might have led researchers to identify phenomena as being supportive of loss aversion even though the phenomena, while involving losses, do not involve comparisons of the impact of losses relative to equivalent gains. As discussed in the previous section, examples include the sunk cost effect, the disposition effect, and others.

Part 4: Future Directions

We believe that the acceptance of loss aversion as a general principle can have the unfortunate effect of biasing research toward confirmatory paradigms that conceal important research questions. To illustrate, we suggest new directions that arise from the recognition that loss aversion is not a general principle. We label these as “research priorities” to encourage future work in the area.

Research Priority 1: Explore the Role of Context in the Psychological Impact of Losses and Gains

Perhaps, the most obvious new direction is to study the relative impact of losses and gains as a function of context. To elaborate, rather than assume loss aversion, we favor a contextual approach that encourages researchers to ask *when* do losses loom larger than gains and vice versa. Asking this question is not intended simply for the sake of categorizing when losses loom larger than gains and vice versa, but primarily as a means to better understand the psychological processes associated with losses and gains. We believe increasing attention to the psychological processes that influence the impact of losses and gains and the contextual moderators that affect the relative strength of these processes will lead to a better understanding of how losses and gains affect behavior.

Such an approach does not eschew the possibility that losses loom larger than gains in some contexts or identifiable situations, but it embraces for study the prospect that events can be perceived as clear losses and yet have no additional psychological impact than similar gains, or might even have less impact than similar gains. Indeed, a steady growth of emerging research is consistent with this idea (e.g., Erev et al., 2008; Ert & Erev, 2013; Ert & Yechiam, 2010; Hochman & Yechiam, 2011; Mukherjee et al., 2017). Moreover, as more work turns to examine cases where losses receive equivalent or less impact than gains an appreciation of a contextual perspective will certainly be required.

As a recent example of an effort consistent with a contextual approach, consider work by Walasek and Stewart (2015). The authors introduce decision sampling as one potential origin for loss aversion. In brief, the authors propose that individuals can demonstrate loss aversion, loss neutrality, as well as the reverse of loss aversion as a function of variations in the range of losses and gains available to them. For example, when the range of losses is small (e.g., losses up to \$20) compared with the range of gains (e.g., gains up

to \$40), any given loss is more psychologically impactful because it represents a greater overall amount of the maximal loss. In contrast, when the range of gains is small (e.g., gains up to \$20) compared with the range of losses (e.g., losses up to \$40), any given gain is viewed as more psychologically impactful because it represents a greater overall amount of the maximal gain. Based on such a procedure, Walasek and Stewart (2015) report evidence for what they term loss aversion, loss neutrality, and the reverse of loss aversion. Although people might weight losses and gains differentially for a variety of reasons, these authors provide one insight that moves beyond loss aversion as a fundamental principle and introduce alternative perspectives consistent with a contextual, process-oriented perspective.

In our work, we have also found results suggesting a need to examine moderators of the relative impact of losses and gains. In particular, we have found preliminary evidence, from both the retention paradigm and from hedonic impact ratings discussed earlier in this article (Gal & Rucker, 2017a, b), that gains are relatively more impactful than losses when it comes to mundane goods (e.g., a mug or internet service), whereas losses might be more impactful than gains when it comes to protected goods, such as a town’s mountain view or lakefront access (Gal & Rucker, 2017a,b). One possible process explanation is that strong social norms exist to protect natural treasures that do not exist for more mundane goods. This might lead people to be willing to pay more to retain (protect) such goods than to obtain them. Another alternative is that the loss of protected goods is perceived as irrevocable, and might, therefore, be construed differently than the loss of a mundane good that can be replaced with relative ease.

Research Priority 2: Understand the Differential Impact of Losses and Gains

The acknowledgment that contextual factors influence the psychological impact of gains and losses does not mean that gains and losses should be treated similarly. In fact, an important question that emerges is how gains and losses might differentially impact psychological processes even in contexts where the magnitude of their effects on feelings or approach/avoidance behavior is similar. Indeed, some researchers have offered evidence that despite losses not being avoided any more than gains are pursued, there can be heightened attention to losses compared with gains (Yechiam & Hochman, 2013). Likewise, these researchers have

argued that losses and gains have different effects on certain types of behavior, which include some that are very relevant to consumer researchers, such as consumer complaints. For example, even though they do not avoid losses more than they pursue gains, people tend to complain more about losses than they tend to praise gains (Yechiam & Hochman, 2013). Relatedly, an examination of differences between losses and gains might move away from a focus on merely examining the valence of the impact of losses and gains toward the specific emotions associated with losses and those associated with gains (cf., Tiedens & Linton, 2001). Thus, a potentially productive avenue for future research is to examine how losses and gains are differentially processed and how they differentially affect specific emotions and behaviors.

Research Priority 3: Examine Gain Utility

Consumer psychologists might also pursue an examination of the utility or pleasure that people derive from gaining goods (*gain utility*; this is not to be confused with Thaler's (1985) definition of *acquisition utility* as the value of a good received compared to the outlay or with the definition of *transaction utility* as the value of the "deal" obtained by consumers). Prior research in consumer behavior has tended to focus on the utility people derive from having or using a product or on the utility of the transaction (i.e., the utility of getting a good deal; Thaler, 1985), but relatively little attention has been paid to the utility of gaining a product or service. It may well be that people derive utility from the act of gaining things that is independent of the utility gained from the value of the product in use or deal value of the object acquired. That this idea has hardly been investigated to date is surprising, since lay experience suggests that people derive a great deal of enjoyment from gaining things, whether it be from buying something themselves while shopping or receiving something as a gift. Many of us are familiar with people who love to shop, yet appear to have little compunction about discarding items that they were excited to buy and then seldom used. Indeed, one recent study found evidence consistent with the idea that people often derive enjoyment from gaining new things that can outweigh the loss of owned possessions: Bellezza, Ackerman, and Gino (2017) found that consumers sometimes tend to be careless with old products to give themselves an excuse to upgrade to a new product.

The relative lack of attention to the pleasure of gaining might be traced to researchers' focus on the

pain of losing (e.g., "the pain of paying," Prelec & Loewenstein, 1998) due to viewing consumer behavior through the loss aversion lens. Regardless, an investigation of the utility of gain is central to the question of why people buy and acquire things, which itself is central to consumer research. As part of an investigation into the pleasure of gaining, researchers might examine how contextual influences affect the pleasure associated with gaining things. For example, in preliminary work, we have found evidence that people enjoy gaining things that are lost (e.g., finding a lost flashlight) more than they enjoy gaining new things (Gal & Rucker, 2017b).

Conclusion

In sum, we suggest that moving beyond loss aversion as a generalized principle, and the acceptance of a more contextual perspective on the psychological impact of gains versus losses, offers fruitful new beginnings for important research questions. Of note, this does not inherently dismiss or discredit the value of the early papers and paradigms devoted to the study of loss aversion. Indeed, those papers will forever remain scientific breakthroughs for the field at that time; they introduced a novel idea that individuals' judgments tend to be influenced by losses and gains relative to a reference point and that losses and gains of equivalent magnitude need not have equivalent psychological impact. However, our proposition is that the overgeneralization of loss aversion risks obfuscation of the psychological processes that are associated with losses and gains and, thereby, leads to neglect of the idea that gains can also loom psychologically larger than losses, or, in other cases that gains and losses will have similar psychological impact. Indeed, a greater focus on understanding the psychological processes associated with losses and gains and their contextual moderators may increase scientific inquiry and complexity in a way that allows greater precision in the prediction of human behavior. Thus, perhaps ironically, if this potential is realized, the loss of loss aversion might loom larger than its gain.

References

- Aiyagari, S. R., & Gertler, M. (1991). Asset returns with transactions costs and uninsured individual risk. *Journal of Monetary Economics*, 27, 311–331.

- Allais, M. (1953). Le Comportement de l'Homme Rationnel devant le Risque: Critique des Postulats et Axiomes de l'Ecole Americaine. *Econometrica*, 21, 503–546.
- American Economic Association. (2001). Matthew Rabin, 2001 Clark Medalist. Retrieved January 9, 2017, from <https://www.aeaweb.org/about-aea/honors-awards/bates-clark/matthew-rabin>
- Ariely, D., Huber, J., & Wertenbroch, K. (2005). When do losses loom larger than gains? *Journal of Marketing Research*, 42, 134–138.
- Arkes, H. R., & Blumer, C. (1985). The psychology of sunk cost. *Organizational Behavior and Human Decision Processes*, 35, 124–140.
- Bansal, R., & Yaron, A. (2004). Risks for the long run: A potential resolution of asset pricing puzzles. *The Journal of Finance*, 59, 1481–1509.
- Barber, B., & Odean, T. (1999). Do investors trade too much? *American Economic Review*, 89, 1279–1298.
- Barber, B. M., & Odean, T. (2000). Trading is hazardous to your wealth: The common stock investment performance of individual investors. *The Journal of Finance*, 55, 773–806.
- Baron, J., & Ritov, I. (1994). Reference points and omission bias. *Organizational Behavior and Human Decision Processes*, 59, 475–498.
- Bell, D. R., & Lattin, J. M. (2000). Looking for loss aversion in scanner panel data: The confounding effect of price response heterogeneity. *Marketing Science*, 19, 185–200.
- Bellezza, S., Ackerman, J. M., & Gino, F. (2017). "Be Careless with That!" availability of product upgrades increases cavalier behavior toward possessions. *Journal of Marketing Research*, 54, 768–784.
- Benartzi, S., & Thaler, R. H. (1995). Myopic loss aversion and the equity premium puzzle. *The Quarterly Journal of Economics*, 110, 73–92.
- Ben-Zion, U., Erev, I., Haruvy, E., & Shavit, T. (2010). Adaptive behavior leads to under-diversification. *Journal of Economic Psychology*, 31, 985–995.
- Camerer, C. F. (2000). Prospect theory in the wild. Evidence from the field. In G. L. C. Camerer, & M. Rabin (Eds.), *Advances in behavioral economics* (pp. 148–161). New York, NY: Princeton University Press.
- Camerer, C. F. (2004). Prospect theory in the wild: Evidence from the field. In C. F. Camerer, G. Loewenstein, & M. Rabin (Eds.), *Advances in behavioral economics* (pp. 148–161). Princeton, NJ: Princeton University Press.
- Camerer, C. (2005). Three cheers—psychological, theoretical, empirical—for loss aversion. *Journal of Marketing Research*, 42, 129–133.
- Camerer, C. F. (2006). *Behavioral economics*. London: World Congress of the Econometric Society.
- Camerer, C., & Thaler, R. H. (2003). In honor of Matthew Rabin: Winner of the John Bates Clark medal. *The Journal of Economic Perspectives*, 17, 159–176.
- Carmon, Z., & Ariely, D. (2000). Focusing on the forgone: How value can appear so different to buyers and sellers. *Journal of Consumer Research*, 27, 360–370.
- Chernev, A. (2004). Goal orientation and consumer preference for the status quo. *Journal of Consumer Research*, 31, 557–565.
- Chomsky, N. (1959). Review of Skinner's verbal behavior. *Language*, 35, 26–58.
- Conslisk, J. (1993). The utility of gambling. *Journal of Risk and Uncertainty*, 6, 255–275.
- Constantinides, G. M. (1990). Habit formation: A resolution of the equity premium puzzle. *Journal of Political Economy*, 98, 519–543.
- Constantinides, G. M., Donaldson, J. B., & Mehra, R. (2002). Junior can't borrow: A new perspective on the equity premium puzzle. *The Quarterly Journal of Economics*, 117, 269–296.
- Erev, I., Ert, E., Plonsky, O., Cohen, D., & Cohen, O. (2017). From anomalies to forecasts: Toward a descriptive model of decisions under risk, under ambiguity, and from experience. *Psychological Review*, 124, 1–56, Forthcoming.
- Erev, I., Ert, E., & Roth, A. E. (2010). A choice prediction competition for market entry games: An introduction. *Games*, 1, 117–136.
- Erev, I., Ert, E., & Yechiam, E. (2008). Loss aversion, diminishing sensitivity, and the effect of experience on repeated decisions. *Journal of Behavioral Decision Making*, 21, 575–597.
- Ert, E., & Erev, I. (2013). On the descriptive value of loss aversion in decisions under risk: Six clarifications. *Judgment and Decision Making*, 8, 214–235.
- Ert, E., & Yechiam, E. (2010). Consistent constructs in individuals' risk taking in decisions from experience. *Acta Psychologica*, 134, 225–232.
- Fama, E. F., & French, K. R. (2002). The equity premium. *The Journal of Finance*, 57, 637–659.
- Friedman, M., & Savage, L. J. (1948). The utility analysis of choices involving risk. *Journal of Political Economy*, 56, 279–304.
- Gal, D. (2006). A psychological law of inertia and the illusion of loss aversion. *Judgment and Decision Making*, 1, 23–32.
- Gal, D., & Rucker, D. D. (2017a). Do Losses Loom Larger Than Gains? Evidence from the Retention Paradigm. *Working Paper*.
- Gal, D., & Rucker, D. D. (2017b). The hedonic impact of losses and gains of diverse goods. *Working Paper*.
- Greenwald, A. G., Pratkanis, A. R., Leippe, M. R., & Baumgardner, M. H. (1986). Under what conditions does theory obstruct research progress? *Psychological Review*, 93, 216–229.
- Hardie, B. G., Johnson, E. J., & Fader, P. S. (1993). Modeling loss aversion and reference dependence effects on brand choice. *Marketing Science*, 12, 378–394.
- Harinck, F., Van Dijk, E., Van Beest, I., & Mersmann, P. (2007). When gains loom larger than losses reversed loss aversion for small amounts of money. *Psychological Science*, 18, 1099–1105.
- Hochman, G., & Yechiam, E. (2011). Loss aversion in the eye and in the heart: The autonomic nervous system's

- responses to losses. *Journal of Behavioral Decision Making*, 24, 140–156.
- Isoni, A. (2011). The willingness-to-accept/willingness-to-pay disparity in repeated markets: Loss aversion or 'bad-deal' aversion? *Theory and Decision*, 71, 409–430.
- Johnson, E. J., & Goldstein, D. (2003). Do defaults save lives? *Science*, 302, 1338–1339.
- Johnson, E. J., Haubl, G., & Keinan, A. (2007). Aspects of endowment: A query theory of value construction. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 33, 461–474.
- Kahneman, D. (2003). Daniel Kahneman – Biographical. Retrieved January 9, 2017, from http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2002/kahneman-bio.html
- Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY: Farrar, Straus and Giroux.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1990). Experimental tests of the endowment effect and the Coase theorem. *Journal of Political Economy*, 98, 1325–1348.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *The Journal of Economic Perspectives*, 5, 193–206.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47, 263–291.
- Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American Psychologist*, 39, 341–350.
- Katz, L. (1964). Effects of differential monetary gain and loss on sequential two-choice behavior. *Journal of Experimental Psychology*, 68, 245–249.
- Koritzky, G., & Yechiam, E. (2010). On the robustness of description and experience based decision tasks to social desirability. *Journal of Behavioral Decision Making*, 23, 83–99.
- Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago, IL: University of Chicago Press.
- Kuhn, T. S. (1970). *The structure of scientific revolutions* (2nd ed.). Chicago, IL: University of Chicago Press.
- Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes*, 76, 149–188.
- Lewis, M. (2016). *The undoing project: A friendship that changed our minds*. New York, NY: W. W. Norton and Company.
- Lieberman, N., Idson, L. C., & Higgins, E. T. (2005). Predicting the intensity of losses vs. non-gains and non-losses vs. gains in judging fairness and value: A test of the loss aversion explanation. *Journal of Experimental Social Psychology*, 41, 527–534.
- Markowitz, H. (1952). The utility of wealth. *Journal of Political Economy*, 60, 151–158.
- Mazumdar, T., & Papatla, P. (2000). An investigation of reference price segments. *Journal of Marketing Research*, 37, 246–258.
- McGraw, A. P., Larsen, J. T., Kahneman, D., & Schkade, D. (2010). Comparing gains and losses. *Psychological Science*, 21, 1438–1445.
- Mellers, B., Schwartz, A., & Ritov, I. (1999). Emotion-based choice. *Journal of Experimental Psychology: General*, 128, 332–345.
- Mukherjee, S., Sahay, A., Pammi, V. C., & Srinivasan, N. (2017). Is loss-aversion magnitude-dependent? Measuring prospective affective judgments regarding gains and losses. *Judgment and Decision Making*, 12, 81–89.
- Nayakankuppam, D., & Mishra, H. (2005). The endowment effect: Rose-tinted and dark-tinted glasses. *Journal of Consumer Research*, 32, 390–395.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231–259.
- Novemsky, N., & Kahneman, D. (2005). The boundaries of loss aversion. *Journal of Marketing Research*, 42, 119–128.
- Odean, T. (1998). Are investors reluctant to realize their losses? *The Journal of Finance*, 53, 1775–1798.
- O'Keefe, D. J., & Jensen, J. D. (2007). The relative persuasiveness of gain-framed loss-framed messages for encouraging disease prevention behaviors: A meta-analytic review. *Journal of Health Communication*, 12, 623–644.
- Prelec, D., & Loewenstein, G. (1991). Decision making over time and under uncertainty: A common approach. *Management Science*, 37, 770–786.
- Prelec, D., & Loewenstein, G. (1998). The red and the black: Mental accounting of savings and debt. *Marketing Science*, 17, 4–28.
- Rabin, M. (2002). A perspective on psychology and economics. *European Economic Review*, 46, 657–685.
- Rabin, M. (2003). The Nobel memorial prize for Daniel Kahneman. *The Scandinavian Journal of Economics*, 105, 157–180.
- Rabin, M., & Thaler, R. H. (2001). Anomalies: Risk aversion. *The Journal of Economic Perspectives*, 15, 219–232.
- Rietz, T. A. (1988). The equity risk premium a solution. *Journal of Monetary Economics*, 22, 117–131.
- Ritov, I., & Baron, J. (1992). Status-quo and omission biases. *Journal of Risk and Uncertainty*, 5, 49–61.
- Ritov, I., & Baron, J. (1995). Outcome knowledge, regret, and omission bias. *Organizational Behavior and Human Decision Processes*, 64, 119–127.
- Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review*, 5, 296–320.
- Samuelson, P. A. (1963). Risk and uncertainty: A fallacy of large numbers. *Scientia Sinica*, 98, 108–113.
- Schweitzer, M. (1994). Disentangling status quo and omission effects: An experimental analysis. *Organizational Behavior and Human Decision Processes*, 58, 457–476.
- Simonsohn, U. (2014). Citing Prospect Theory. Retrieved January 9, 2017, from <http://datacolada.org/15>
- Simonson, I., & Drolet, A. (2004). Anchoring effects on consumers' willingness-to-pay and willingness-to-accept. *Journal of Consumer Research*, 31, 681–690.
- Simonson, I., & Tversky, A. (1992). Choice in context: Tradeoff contrast and extremeness aversion. *Journal of Marketing Research*, 29, 281.

- Sonsino, D., Erev, I., & Gilat, S. (2002). *On rationality, learning and zero-sum betting—an experimental study of the no-betting conjecture*. Retrieved January 12, 2017, from http://www.researchgate.net/profile/Doron_Sonsino/publication/247016898_On_Rationality_Learning_and_Zero-Sum_Betting-An_Experimental_Study_of_the_No-Betting_Conjecture/links/0046353ca688e9378c000000.pdf
- Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior & Organization*, 1, 39–60.
- Thaler, R. (1985). Mental accounting and consumer choice. *Marketing Science*, 4, 199–214.
- Thaler, R. H. (2000). From *Homo economicus* to *Homo sapiens*. *The Journal of Economic Perspectives*, 14, 133–141.
- Tiedens, L. Z., & Linton, S. (2001). Judgment under emotional certainty and uncertainty: The effects of specific emotions on information processing. *Journal of Personality and Social Psychology*, 81, 973–988.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211, 453–458.
- Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of Business*, 59, S251–S278.
- Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics*, 106, 1039–1061.
- Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, 5, 297–323.
- Walasek, L., & Stewart, N. (2015). How to make loss aversion disappear and reverse: Tests of the decision by sampling origin of loss aversion. *Journal of Experimental Psychology: General*, 144, 7–11.
- Weaver, R., & Frederick, S. (2012). A reference price theory of the endowment effect. *Journal of Marketing Research*, 49, 696–707.
- Wiarda, H. (2010). *Grand theories and ideologies in the social sciences*. New York, NY: Springer.
- Yechiam, E., Ashby, N. J., & Pachur, T. (2017). Who's biased? A meta-analysis of buyer–seller differences in the pricing of lotteries. *Psychological Bulletin*, 143, 543–563.
- Yechiam, E., & Ert, E. (2007). Evaluating the reliance on past choices in adaptive learning models. *Journal of Mathematical Psychology*, 51, 75–84.
- Yechiam, E., & Hochman, G. (2013). Losses as modulators of attention: Review and analysis of the unique effects of losses over gains. *Psychological Bulletin*, 139, 497–518.