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Revisiting the status quo bias: Replication of Samuelson and Zeckhauser (1988)

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Status quo bias refers to people's general preference to stick to, or continue with, a previously chosen option. In two pre-registered experiments with U.S. participants recruited from the Amazon Mechanical Turk (n_1 = 311, n_2 = 316), we attempted to replicate four decision scenarios (Question 1, 2, 4, and 6) from Samuelson and Zeckhauser (1988), the seminal article that provided the first experimental demonstration of the status quo bias. We found strong empirical support for the status quo bias in three decision scenarios out of the four, including budget allocation (Scenario 1/Question 1 in the original article), investment portfolios (Scenario 3/Question 2), and college jobs (Scenario 4/Question 4). However, we failed to find substantial support for the status quo bias in the wagon color choice scenario (Scenario 2/Question 6). We discuss the implications of our results and possible explanations using multiple accounts put forward in the status quo bias literature.

Keywords: status quo bias, judgment and decision making, replication

People tend to favor things as they are. The status quo bias refers to people's general tendency to stick with a previously chosen option in the face of other alternatives. In a seminal paper, Samuelson and Zeckhauser (1988) surveyed participants with hypothetical decision questions. They found that framing an option as the status quo resulted in a higher choice rate of that option, compared with framing it neutrally or as an alternative to the status quo (or non-status quo). Further supplementing the experimental results with field evidence, they demonstrated that the status quo bias is pervasive and profound in people's decision-making.

In this article, we report two attempts to replicate Samuelson and Zeckhauser (1988). Based on LeBel et al.'s (2018) criteria for evaluating replications, we classified our experiments to be *very close replications* of the original study, as they differed only in terms of physical settings and contextual variables (i.e., those that are beyond researchers' control; please refer to Figure 2S and Table 12S in the supplementary for details regarding the criteria and the classification). Our goal was to revisit these classic findings, to examine whether they withstand the test of time, and to accumulate further evidence to try and establish more precise effect size estimates (Nosek & Lakens, 2014). We begin by introducing the literature on the status quo bias and the chosen article for replication, i.e., Samuelson and Zeckhauser (1988). We then highlight the motivation for the current replication study, present the results, and discuss their implications.

Status quo bias

Samuelson and Zeckhauser (1988) were the first to demonstrate the status quo bias using controlled experiments. In part of their investigation, they presented a series of hypothetical decision-making scenarios and asked participants to choose among several available options. The scenarios and options came in two versions: in the neutral version, all options were presented equally as they were, without any framing, whereas in the status quo version (SQ), one option was framed as the status quo and the other options were reframed either as a change or in reference to the status quo option. The options were effectively the same in both versions.

Samuelson and Zeckhauser (1988) found that options were chosen more often when framed as the status quo, compared with when they were framed as an alternative to the status quo or without any framing. The status quo framing consistently led to the highest rate of choice, followed by the neutral framing and then by the non-status quo framing. Additionally, they showed that preference for status quo options became more pronounced as the number of options increased (see also Tversky & Shafir, 1992; Redelmeier & Shafir, 1995).

People may sometimes be willing to continue with the status quo despite its lower utility compared to available alternatives (e.g., Suri et al., 2013). For instance, Samuelson and Zeckhauser (1988, p. 10) described a case where a small town in Germany was to be relocated due to a mining project. The authority offered the townspeople several planning options for the new town, which would be established at the authority's expense. Surprisingly, the townspeople opted for a plan quite much like that of the old town. The intricate layout of the old town that had evolved through centuries was unlikely to be efficient in modern times. Nonetheless, people chose it, arguably because of their preference for the status quo. Apparently, the status quo bias violates one of the foremost assumptions in rational decision-making theory that people aim to maximize expected utility and minimize loss (Tversky & Kahneman, 1991). Should this assumption have held, the townspeople would have been happy to see their new town be built using modern knowledge of city planning but not as a legacy of centuries' history.

The status quo bias challenges yet another, more specific assumption in rational decision-making models, which states that only preference-relevant features matter in choosing among alternatives (Samuelson & Zeckhauser, 1988). Economists once assumed that decision makers have well-defined and relatively stable preferences and make decisions accordingly (Kahneman et al., 1991). These preferences are determined by the overall value of options for a decision maker (i.e., *utility*) after the decision maker evaluated those features of their concern. Once their preferences are set, the decision maker will go for the option with the highest expected utility, ignoring those preference-irrelevant variables. For instance, the order in which the options are presented or the labels they carry (e.g., a label of being the status quo) should not influence the decision. Conversely, if we know a decision maker's choice among several options, we can confidently infer that the chosen option has the highest expected utility for, and hence preferred the most by, that person. We can infallibly predict that the same option will be chosen regardless of, e.g., how the available options are presented, if there is no alternative with a higher expected utility.

This assumption no longer holds in the case of the status quo bias. Samuelson and Zeckhauser (1988) showed that a status quo can drastically influence decision makers' choices. An option chosen when framed as the status quo may no longer be as preferred when framed as a non-status quo, despite that available options all remained the same. The implications of their results are profound, if we consider how often in real life we make decisions where there is a status quo. Arguably, continuing with the current choice or situation is almost always an option.

Indeed, empirical evidence so far suggests that the status quo bias has a great influence in real life judgment and decision-making. Unlike the experiments by Samuelson and Zeckhauser (1988, Part One), where options became the status quo because they were so framed, studies on the status quo bias in real life involved actual past choices. For instance, Samuelson and Zeckhauser (1988) went to the field to examine the choice of health insurance plans by Harvard employees and the allocation of retirement contributions to different funds by faculty throughout the U.S. Again, evidence pointed to a prominent status quo bias: Harvard employees tended to stick with the insurance plan they initially chose, despite the presence of a more attractive option. Teachers

across the States tended to maintain one allocation ratio towards different retirement funds, though a change was easy and bore almost no cost. Similarly, Hartman et al. (1991) surveyed around 1,500 consumers in the U.S. on the reliability and rate of their electricity service. The researchers found that around 60 percent households, regardless of the actual reliability of the services they received, indicated that they preferred the status quo the most (p. 149). Johnson and colleagues (1993) looked into the automobile insurance industry in New Jersey and Pennsylvania, where different status quos were present. They found that when given an option to lower insurance rates by reducing the right to sue, 75% of Pennsylvanians chose to retain their full right; in contrast, when given an option to obtain the full right to sue by paying higher rates, only 20% of those in New Jersey chose that option (p. 48). These studies have provided strong evidence for the pervasiveness of the status quo bias in the real world.

The status quo bias has been a handy tool in explaining many social phenomena. For instance, Samuelson and Zeckhauser (1988, p. 9) linked the bias to incumbent office holders' advantage in elections (see Cox & Morgenstern, 1993; Erikson, 1971; Muthukrishnan, 1995). Based on their estimation, an incumbent officer would claim a 59 over 41 percent victory if the officer and a competitor were equally preferred without incumbency. In marketing, a wide range of soft-selling techniques make use of the status quo bias. Experienced marketers often induce consumers into what is called a trial purchase (Thaler, 1980), where the product can later be returned with full refund. Though a free trial appears to impose no loss to consumers, it becomes the status quo that the consumers will later find it hard to live without and, therefore, give up the refundable payment to continue their ownership of the item. Also, the status quo bias may play a role in brand loyalty (Shi et al., 2018) and pioneering, or first-mover, advantages, i.e., first entrants into a market obtain long-term market share advantages over followers (Kleiser & Wagner, 1999; Lieberman & Montgomery, 1988). Apart from marketing studies, research has also explored the bias in mating choices (Gunaydin et al., 2018) and technological reforms (Montpetit & Lachapelle, 2017).

From a broader perspective, the status quo bias may also explain why public policy making is sluggish (Atkinson, 2011) and scientific progress is more like a series of revolutions rather than an incremental accumulation of small advances (Kuhn, 2012). New policies are hard to establish, and old ones are hard to abolish. A well-received scientific paradigm could dominate researchers' attention and resources for years and even decades. In sum, our evidence and theoretical conjectures imply that the status quo bias is pervasive in economic, scientific, social, and cultural decision-making situations.

Explaining the status quo bias

Numerous accounts have been put forward to explain the status quo bias. They fall roughly into two categories. Some attempted to accommodate the bias into a rational decision-making framework, arguing that the seemingly irrational preference for the status quo option can be consistent with the goal of utility maximization or accounted for axiomatically without appealing to psychology-based explanations (e.g., Dupont & Lee, 2002; Masatlioglu & Ok, 2005; Nebel, 2015). Others appealed to a series of non-rational psychological mechanisms in explaining the status quo preference, such as heuristics, biases, and misperceptions (Eidelman & Crandall, 2012; Samuelson & Zeckhauser, 1988; see also Anderson, 2003). We briefly introduce some of these accounts, beginning with those deeming it rational to prefer the status quo.

Rational accounts

For those who consider the status quo bias rational, people exhibit this "bias" simply because their preferences have not changed, they find switching to a non-status quo costly, or they feel uncertain about the outcome of switching (Anderson, 2003; Nebel, 2015). One major reason why people resist changes in real life is the cost associated with transitions. Such cost may be trivial in deciding which dishes to order, but can be overwhelming in cases of changing jobs, moving home, and implementing new public rules (Iyengar & Lepper, 2000). If alternatives do not show clear superiority, people are likely to stick with the status quo as it is normally easier to do so and it incurs predictable costs.

Decision makers often do not have complete information about available choices, and a thorough analysis of the pros and cons of each choice may at times be costly and impractical, even impossible in

some cases (Gigerenzer & Selten, 2002; Lieder & Griffiths, 2020). On such occasions where decision makers have a high degree of uncertainty, maintaining the status quo is a safe and hence rational choice (Samuelson & Zeckhauser, 1988). If an option has worked out in the past, one could reasonably expect it to also work out in the future; if an option has been chosen by one in the past, the person could reasonably assume that the choice has passed his or her inspection, and possibly the inspection of many others (Eidelman & Crandall, 2012). As Samuelson and Zeckhauser (1988) pointed out, people commonly use a cut-off strategy in decision-making: as long as the current option is good enough (Simon, 1956), there is no impetus to run an arduous analysis of alternatives and initiate a change. A satisficing strategy, i.e., stay with a sufficiently good option rather than continuously look for the best, can be rational in an uncertain world (Schwartz et al., 2002, 2011).

These accounts that subsume the preference for the status quo within the rational decision-making framework are plausible but may be insufficient. For example, Samuelson and Zeckhauser (1988) explicitly ruled out transitional costs in the descriptions of their hypothetical decision-making scenarios and still observed the status quo bias. Also, with respect to the account that appeals to decision makers' limited information, the scenarios, however, did not provide more information for the status quo option than for the alternatives. Apart from being framed differently, the options were comparable in terms of the amount of information they carried.

Participants might, however, had assumed that they knew more about the status quo. For instance, for Question 4 in Samuelson and Zeckhauser (1988), participants chose from different college job offers. They were employed by one of the colleges if they received the status quo version of the question. This could have led participants to think that they knew more about their current workplace than the alternatives (e.g., about colleagues) and hence choose it due to factors unspecified in the option descriptions. Nonetheless, such considerations were not as prominent in the other questions in the study, and it was unlikely that participants really read these considerations into their decision-making processes, because they were not motivated to do so (Samuelson & Zeckhauser, 1988, p. 9). Overall, rational accounts fall short in explaining the status quo bias on their own.

Non-rational accounts

The status quo bias has been linked to loss aversion, a cognitive misperception whereby people weigh losses more than equal gains (Tversky & Kahneman, 1991; Mrkva et al., 2020). Because of this misperception, when faced with a decision involving risk, people tend to be risk-avoidant when decision outcomes are framed as gains and risk-seeking when the same outcomes are framed as losses (Tversky & Kahneman, 1981). To explain the status quo bias with loss aversion, consider the situation where one decides between two different but similarly appealing options. Since the options are different but have similar levels of appeal, choosing either of them implies gains in some respects and losses in some others, and the gains and losses cancel each other out. However, if one option is made the status quo and the decision maker takes that option as a reference point, the losses of switching to the other option would outweigh the gains due to loss aversion (Moshinsky & Bar-Hillel, 2010; Thaler, 1980). Consequently, switching is unlikely if neither option shows a clear advantage. Loss aversion per se can explain the status quo bias in the case of multiple similarly attractive options.

Researchers have invoked heuristics and several other biases to account for the preference for the status quo, such as anchoring, the longevity and existence biases, and the mere exposure effect (Eidelman & Crandall, 2012; Samuelson & Zeckhauser, 1988). Anchoring is the phenomenon that people's judgments are biased towards initially presented information (Ariely et al., 2003; Tversky & Kahneman, 1974). For instance, Ariely et al. (2003) observed a positive correlation between participants' social security numbers, which were explicitly asked for, and the minimal prices they would like to pay for a bottle of wine (replicated in Bergman et al., 2010; but challenged by Fudenberg et al., 2012; Maniadis et al., 2014). Samuelson and Zeckhauser (1988) argued that the same phenomenon underlies the status quo bias, particularly with respect to decision questions with continuous options, e.g., Question 7 and 8 in their study.

The existence and longevity biases refer to people's often unthinking assumptions that existing and longstanding things are good (Eidelman et al., 2009, 2010). They are thought to underlie the status quo bias (Eidelman & Crandall, 2012, 2014): we maintain

the status quo simply because it already exists and outlasts other alternatives. Additionally, being the status quo can increase an option's exposure to the decision maker, and makes the person like the option more due to the mere-exposure effect (Eidelman & Crandall, 2014; Zajonc, 1968). Although interrelated, the mere-exposure effect and existence and longevity biases may work independently in leading to a preference for the status quo. People need not infer existence and longevity from exposure, and existence alone does not necessarily entail more exposures (Eidelman & Crandall, 2012, 2014).

People can sometimes be motivated to continue with and even defend the status quo. Cognitive dissonance theory predicts that maintaining conflicting ideas or stances simultaneously is hard and unpleasant, and people continuously strive for consistency between beliefs and behaviors (Festinger, 1962; Festinger & Carlsmith, 1959). Past choices reveal people's attitudes and preferences (self-perception theory; Bem, 1972), and people tend to remember those reasons for (rather than against), or even fabricate reasons in support of (i.e., rationalize), their past decisions (Brehm, 1956; Eyster, 2002; Eidelman & Crandall, 2014). Deviating from the status quo can therefore be unpleasant and challenging. Consequently, people are driven to stick with the status quo and even find it reasonable, desirable, and just (Jost et al., 2004; Kay et al., 2009), so that the validity of their reasons is affirmed, and the consistency between their beliefs and behaviors is maintained.

Emotions, particularly regret, may play a role in the status quo bias. Changing the status quo typically requires an act, and research has shown that in many cases, people experience greater regret when a negative outcome results from action rather than inaction (Ritov & Baron, 1992; cf. Inman & Zeelenberg, 2002; see also Connolly & Zeelenberg, 2002 regarding the role of justification). Consequently, people tend to maintain the status quo to avoid regret. A separate line of research has found that positive moods are associated with a larger status quo bias, suggesting that people may stick to the status quo to prolong a desirable mental state (Shevchenko et al., 2014; Yen & Chuang, 2008). Changing the status quo often entails material transition costs. On top of that, contemplating about a change and analyzing available alternatives can incur *mental costs*, which often manifest as negative emotional states, e.g., fear and anxiety (sometimes collectively termed anticipatory emotions; Anderson, 2003; Loewenstein et al., 2001). People can avoid such emotions by maintaining the status quo, particularly when they find it difficult to make trade-offs (per the *trade-off avoidance hypothesis*; see Luce, 1998; Luce et al., 1997). Unless motivated, people may even refrain from contemplating about a change at the first place, which is consistent with organisms' general tendency to conserve their energy (Anderson, 2003).

There is no merit in thinking that any of the abovementioned factors fully explains the status quo bias. Our preference for the status quo can result from many of them at the same time. The critical task is to determine how option features, decision contexts, and individual differences interplay to enhance, mitigate, eliminate, or even reverse the bias, and ideally, the respective weights of these different factors.

One final note concerning the status quo bias: The bias is often discussed together with other conceptually similar phenomena, such as the omission bias (preference for inaction over action; Ritov & Baron, 1992; Baron & Ritov, 1994), inaction inertia (initial inaction persists; Tykocinski et al., 1995; Tykocinski & Pittman, 1998), as well as choice deferral (Dhar, 1996). These phenomena share some common mechanisms and are collectively referred to as decision avoidance (Anderson, 2003). Nonetheless, they are still different concepts and cannot be used interchangeably (Feldman et al., 2020), and there is some evidence showing that these phenomena operate independently (Baron & Ritov, 1994; Schweitzer, 1994).

Choice of study for replication

We chose Samuelson and Zeckhauser's (1988) study as our replication target for two reasons: its impact and the absence of direct replications. The article was one of the earliest and most cited works on the status quo bias, with over five thousand Google Scholar citations at the time of writing. And there have been many important follow-up empirical and theoretical works, such as Kahneman et al.'s (1991) work that linked the status quo bias to loss aversion. Despite its high impact, to the best of our knowledge, there have been no published pre-registered direct replications of the study thus far.

The status quo bias has profound real-world implications. It may explain many social phenomena relevant to human judgment and decision making. Hence, it is critical to take this bias into consideration when we make important decisions. A carefully chosen status quo can have a great social impact to the extent that it may save the lives of thousands (Abadie & Gay, 2006; Johnson & Goldstein, 2003).

We hence aimed to revisit this classic phenomenon to examine the replicability of the original findings with independent replications. Although Samuelson and Zeckhauser's (1988) results supported a status quo bias overall, the bias seemed to be less prominent for some options and in some of their decision-making scenarios than in others. By replicating this classic study, we hoped to examine whether such effect size differences were random in nature. If not, there could be something inherent in the decision questions that determine the extent to which decision makers exhibit a preference for the status quo. The replication attempts also answered calls in the recent growing recognition of the importance of reproducibility and replicability in psychological science (Brandt et al., 2014; Open Science Collaboration, 2015; van 't Veer & Giner-Sorolla, 2016; Zwaan et al., 2018), as well as the importance of orienting towards effect sizes (rather than statistical significance) and using a meta-analytic thinking in scientific endeavors (Cumming, 2014). We therefore embarked on well-powered, pre-registered close replications of Samuelson and Zeckhauser (1988).

Original findings in target article

The target article reported a consistent pattern of results across decision-making scenarios that an option was chosen more often when it was framed as the status quo than as a non-status quo or without any framing. Additionally, an option was more likely to be chosen when it was framed neutrally than when it was framed as a non-status quo option. This pattern was present for 17 out of the 24 options from the six four-option decision questions used in the target article. For 14 of the options, the choice rates were significantly higher when they were the status quo than when they were alternatives to the status quo.

We followed the target article to conduct independent-proportions tests to compare the choice rates of options as the status quo and as a non-status quo. Samuelson and Zeckhauser (1988) did not report whether there were significant differences in choice rates between status quo options and neutrally framed options. We conducted these tests and reported the results in the supplementary (Table 3S), because this is a stricter test for the status quo bias. Our hypotheses, therefore, were:

> H_1: Options have higher choice rates when they are framed as the status quo than as a non-status quo (or an alternative to the status quo). This hypothesis was tested in the target article, and *p*-values were reported.
>
> H_2: Options have higher choice rates when they are framed as the status quo than when they are neutrally framed (or when no option is the status quo). The target article did not test this hypothesis with any significance testing procedure.

A summary of the original findings that were relevant to our replication has been provided in Table 2S and Table 3S in the supplementary. For 10 out of the 16 options that were included in our replications, the choice rate under a status quo framing was significantly higher than that under a non-status quo framing. For 11 options, the choice rate under a status quo framing was higher (in the descriptive sense) than that under a neutral framing, which was in turn higher than that under a non-status quo framing.

We conducted post hoc power analyses and sensitivity analyses on the original study, with a focus on the comparisons between status quo framing and non-status quo framing (i.e., those comparisons that tested H_1; please refer to the supplementary for details, particularly Table 4S and 5S). Our analysis indicated that the post hoc power of the original study ranged from .08 to over .99, with an average of .57 across the 16 options. This means that on average, the original study had only .57 power to detect the observed effect sizes. Also, the post hoc power varied greatly even within scenarios, suggesting that the effect sizes estimates were not very precise, and the original study might be insufficiently powered to provide consistent estimates (but post hoc power should be interpreted cautiously, if at all; see Gelman, 2019). Our sensitivity analyses suggested that the original tests for H_1 (i.e., two-tailed independ-

ent-proportions tests) were powered at .80 to detect, on average, a Cohen's *h* of 0.58, a medium-to-large effect by Cohen's (1988) benchmarks. For some options, the test could only detect a Cohen's *h* over 0.70 at .80 power. Overall, we concluded that the original study was not sufficiently powered.

Overview of replication

The current replications focused on Questions 1, 2, 4, and 6 in Part One of Samuelson and Zeckhauser (1988) and had two phases. The first-phase replication focused on Questions 1 and 6, and the second-phase replication focused on all four questions. We chose to conduct replications on this subset of decision questions to focus on the simplest demonstrations of the status quo bias (i.e., through framing), meet time and resource constraints, and minimize burden on participants in our target samples, which are sensitive to task duration.

For each decision question, participants were either presented a neutral version or a status quo version. In the neutral version, options were presented without any framing, whereas in the status quo version, one option was framed as the status quo, and the other options were reframed with reference to the status quo option or as a change from it. The target study used two-option, three-option, as well as four-option versions for the decision questions. We used only the four-option versions in our replications due to online survey administration time constraints, and for simplifying the design without looking into the number of options as a possible moderating factor.

Pre-registration and open science

We pre-registered our experiments on the Open Science Framework (OSF) and data collection was launched after that. Pre-registrations, power analyses, and all materials used in these experiments have been shared on the OSF (project main page: https://osf.io/kh8q3/; first-phase pre-registration: https://osf.io/c3phs; second-phase pre-registration: https://osf.io/69hzx). Full open-science details and disclosures are provided in the supplementary. All measures, manipulations, and exclusions in this investigation have been reported and shared.

Methods

Participants

A total of 311 (M_{age} = 38.05, *SD* = 12.38; 164 (52.7%) females) and 316 (M_{age} = 38.79, *SD* = 11.67; 161 (50.9%) females) Amazon Mechanical Turk (MTurk) participants completed the first and the second phases of our replications, respectively. There was a one-year time lag between the two data collections. The second data collection was meant to verify results from first data collection, extend the number of scenarios, and improve on technical issues such as introducing randomized presentation order of the scenarios. A comparison of the original sample and the replication samples has been provided in Table 6S and 7S in the supplementary. We pre-registered our power analyses and reported that we aimed at 300 participants in the pre-registrations. Nevertheless, as one reviewer pointed out, those power analyses were inadequate. Therefore, we conducted an additional "post hoc" (i.e., after data collection) power analysis, which suggested that we would need 355 participants in order to detect a Cohen's medium effect at .95 power with the planned tests. Although we did not meet this number, our sample sizes were close to it, and hence our replications may still be considered to have adequate power. We reported the full sample results here in the main text. For the results after exclusion, please refer to Table 8S to 11S in the supplementary. There were no major discrepancies between these results. Apart from excluding based on the pre-registered criteria, we additionally excluded part of the data as after data collection, we found an error in the questionnaire used in the second-phase replication (please refer to the supplementary for details).

Design and procedure

The experiments had a between-subjects design, and the design was the same in both phases of replication. Four decision questions (Question 1, 6, 2, and 4, referred to as Scenarios 1 to 4 in our replications) were adopted from Samuelson and Zeckhauser (1988). The order of presentation was fixed in the first phase but randomized in the second phase (there was no sign that this variation had any major influence on the results). The questions asked participants to evaluate and decide among different (1)

budget allocation ratios for safety research programs, (2) color options for a wagon that one just purchased, (3) investment portfolios, and (4) college job offers. Each question had four options. Participants in the first-phase replication answered Scenario 1 and 2 only, whereas those in the second phase answered all four scenarios.

Manipulations

Each Scenario was presented in one out of five versions: one neutral version and four status quo versions. In the neutral version, no option was the status quo. In the status quo versions, one of the four options was framed as the status quo, i.e., as a previously chosen or the default option. Participants were randomly presented with only one version for each scenario.

Take Scenario 1 as an example. This scenario was about different budget allocation ratios for safety research programs. The below was the neutral version:

> The National Highway Safety Commission is deciding how to allocate its budget between two safety research programs: (1) improving automobile safety (bumpers, body, gas tank configurations, seat-belts), and (2) improving the safety of interstate highways (guard rails, grading, highway interchanges, and implementing selective reduced speed limits). Since there is a ceiling on its total spending, it must choose between the options provided below. If you had to make this choice, which of the following will you choose?
>
> And the four options for the neutral version were:
>
> a. Allocate 70% to auto safety and 30% to highway safety.
> b. Allocate 30% to auto safety and 70% to highway safety.
> c. Allocate 60% to auto safety and 40% to highway safety.
> d. Allocate 50% to auto safety and 50% to highway safety.

One status quo version of Scenario 1, where the "70A30H" option (Option A above) was framed as the status quo, was as below:

> The National Highway Safety Commission is deciding how to allocate its budget between two safety research programs: (1) improving automobile safety (bumpers, body, gas tank configurations, seat-belts), and (2) improving the safety of interstate highways (guard rails, grading, highway interchanges, and implementing selective reduced speed limits). Currently, the commission allocates approximately 70% of its funds to auto safety and 30% of its funds to highway safety. Since there is a ceiling on its total spending, it must choose between the options provided below. If you had to make this choice, which of the following will you choose?
>
> The options for this status quo version were:
>
> a. Maintain present budget amounts for the programs.
> b. Decrease auto program by 10% and raise highway program by like amount.
> c. Decrease auto program by 40% and raise highway program by like amount.
> d. Decrease auto program by 20% and raise highway program by like amount.
>
> The display order of the options was randomized.

All scenario descriptions were followed by a few comprehension questions to ensure that participants read and understood the texts. Particularly, for the status quo versions, participants were additionally asked what the status quo was. They had to answer these comprehension questions correctly before proceeding to see the options and make their choices. This design was meant to address participants' inattentiveness. The median response time for each of the scenarios in the two phases ranged from 19.67 seconds to 31.07 seconds. Since the participants had already read the scenario descriptions before the options were presented (i.e., most of the response time reported above was used to read the options only), we consider this time sufficient for participants to make informed rather than random choices. We provided the response time descriptives in our analysis files for interested readers.

With the version manipulation, each option could take three positions: as the status quo option in one status quo version, as a non-status quo option in three other status quo versions, or as a neutral op-

tion in the neutral version. Participants saw any option under only one framing, in accordance with the between-subjects design of the experiments.

Replication evaluation

As noted in the beginning, we summarized our replications as *very close replications* using the criteria set by LeBel et al. (2018). We aimed to compare the replication effects with the original effects using the criteria set by LeBel et al. (2019) (Figure 1S).

Results

First phase

In Table 1 and 2, we summarized and presented the descriptive statistics and the results of our statistical analyses for the first-phase replication. Scenario 1 and 2 were tested in this phase. We found a consistent pattern in Scenario 1 that an option was chosen more often when it was the status quo than when it was neutrally framed. In addition, options were the least likely to be chosen when they were framed as an alternative to the status quo. This pattern, however, did not emerge in Scenario 2.

Independent-proportions tests were conducted to compare the choice rates between the status quo and non-status quo framing, and between the status quo and the neutral framing. The options in Scenario 1 had significantly higher choice rates as the status quo than as a non-status quo, $\chi^2 \geq 9.38$, $ps \leq .002$, smallest odds ratio = 2.47, 95% CI [1.37, 4.44], smallest Cohen's h = 0.44, 95% CI [0.16, 0.73]. The effects were of medium sizes (0.5) by Cohen's (1988) benchmarks. Comparing the choice rates of options under the status quo framing and the neutral framing, we found, however, one non-significant difference (for the option "30A70H"), $\chi^2 = 1.10$, $p = .294$, odds ratio = 1.46, 95% CI [0.72, 2.97], Cohen's h = 0.19, 95% CI [-0.16, 0.54]. The other three differences were statistically significant, $ps \leq .033$. The effect sizes ranged from 2.16 to 4.83 in odds ratio or 0.38 to 0.57 in Cohen's h. Overall, our data provided strong support for the status quo bias (both H_1 and H_2) in Scenario 1.

Table 1.

Status quo framing vs. non-status quo framing (1st phase)

Options	Choice rates			Status quo framing vs. non-status quo framing			
	SQ	N	NSQ	χ^2	p	Odds ratio (95% CI)	Cohen's h (95% CI)
Scenario 1: Budget allocation ratios							
70A30H	18/62 (.29)	5/64 (.08)	12/185 (.06)	22.12	< .001	5.90 [2.64, 13.15]	0.62 [0.34, 0.91]
30A70H	30/60 (.50)	26/64 (.41)	45/187 (.24)	14.45	< .001	3.16 [1.72, 5.79]	0.55 [0.25, 0.84]
60A40H	24/63 (.38)	10/64 (.16)	23/184 (.12)	19.95	< .001	4.31 [2.20, 8.42]	0.61 [0.32, 0.89]
50A50H	34/62 (.55)	23/64 (.36)	61/185 (.33)	9.38	.002	2.47 [1.37, 4.44]	0.44 [0.16, 0.73]
Scenario 2: Wagon colors							
Red	8/62 (.13)	14/63 (.22)	26/186 (.14)	0.05	.831	0.91 [0.39, 2.13]	-0.03 [-0.32, 0.26]
Silver Blue	35/62 (.56)	37/63 (.59)	108/186 (.58)	0.05	.824	0.94 [0.52, 1.67]	-0.03 [-0.32, 0.25]
Tan	4/62 (.06)	4/63 (.06)	13/186 (.07)	0.02	.885	0.92 [0.29, 2.93]	-0.02 [-0.31, 0.27]
White	18/62 (.29)	8/63 (.13)	36/186 (.19)	2.56	.110	1.70 [0.88, 3.29]	0.23 [-0.06, 0.51]

Note. SQ = status quo, N = neutral, NSQ = non-status quo

We found weak-to-no support for the status quo bias, or H_1 and H_2, in Scenario 2. Comparing the status quo framing with the non-status quo framing, we observed no significant differences in the expected direction, $\chi^2 \leq 2.56$, $ps \geq .110$. Comparing the status quo framing with the neutral framing, only one option (white color) had a significant and small-to-medium difference in the expected direction, $\chi^2 = 5.06$, $p = .024$, odds ratio = 2.81, 95% CI [1.12, 7.07], Cohen's $h = 0.41$, 95% CI [0.06, 0.76].

Table 2.

Status quo framing vs. neutral framing (1st phase)

Options	Choice rates			Status quo framing vs. neutral framing			
	SQ	N	NSQ	χ^2	p	Odds ratio (95% CI)	Cohen's h (95% CI)
Scenario 1: Budget allocation ratios							
70A30H	18/62 (.29)	5/64 (.08)	12/185 (.06)	9.50	.002	4.83 [1.66, 14.00]	0.57 [0.22, 0.92]
30A70H	30/60 (.50)	26/64 (.41)	45/187 (.24)	1.10	.294	1.46 [0.72, 2.97]	0.19 [-0.16, 0.54]
60A40H	24/63 (.38)	10/64 (.16)	23/184 (.12)	8.18	.004	3.32 [1.43, 7.74]	0.52 [0.17, 0.87]
50A50H	34/62 (.55)	23/64 (.36)	61/185 (.33)	4.54	.033	2.16 [1.06, 4.42]	0.38 [0.03, 0.73]
Scenario 2: Wagon colors							
Red	8/62 (.13)	14/63 (.22)	26/186 (.14)	1.87	.171	0.52 [0.20, 1.34]	-0.25 [-0.60, 0.10]
Silver Blue	35/62 (.56)	37/63 (.59)	108/186 (.58)	0.07	.797	0.91 [0.45, 1.85]	-0.05 [-0.40, 0.30]
Tan	4/62 (.06)	4/63 (.06)	13/186 (.07)	0.00	.981	1.02 [0.24, 4.26]	0.00 [-0.35, 0.35]
White	18/62 (.29)	8/63 (.13)	36/186 (.19)	5.06	.024	2.81 [1.12, 7.07]	0.41 [0.06, 0.76]

Note. SQ = status quo, N = neutral, NSQ = non-status quo

Second phase

In Table 3 and 4, we summarized the descriptive statistics and the results of our statistical analyses for the second-phase replication. We observed the hypothesized pattern (i.e., the choice rate of an option is the highest under the status quo framing and the lowest under the non-status quo framing) in 12 out of the 16 options from the four scenarios (the exceptions were: "30A70H" in Scenario 1; silver blue and white in Scenario 2; and College D in Scenario 4).

Table 3.

Status quo framing vs. non-status quo framing (2nd phase)

Options	Choice rates			Status quo framing vs. non-status quo framing			
	SQ	N	NSQ	χ^2	*p*	Odds ratio (95% CI)	Cohen's *h* (95% CI)
Scenario 1: Budget allocation ratios							
70A30H	18/63 (.29)	8/65 (.12)	20/188 (.11)	11.81	.001	3.36 [1.64, 6.88]	0.46 [0.18, 0.75]
30A70H	35/62 (.56)	11/65 (.17)	38/189 (.20)	29.90	< .001	5.15 [2.78, 9.53]	0.77 [0.48, 1.06]
60A40H	25/63 (.40)	14/65 (.22)	36/188 (.19)	10.81	.001	2.78 [1.49, 5.17]	0.46 [0.17, 0.74]
50A50H	40/63 (.63)	32/65 (.49)	36/125 (.29)	20.93	< .001	4.30 [2.26, 8.18]	0.71 [0.41, 1.01]
Scenario 2: Wagon colors							
Red	19/61 (.31)	15/66 (.23)	24/189 (.13)	11.02	.001	3.11 [1.56, 6.20]	0.46 [0.17, 0.74]
Silver Blue	33/66 (.50)	31/66 (.47)	99/184 (.54)	0.28	.595	0.86 [0.49, 1.51]	-0.08 [-0.36, 0.21]
Tan	10/60 (.17)	6/66 (.09)	15/190 (.08)	3.90	.048	2.33 [0.99, 5.51]	0.27 [-0.02, 0.56]
White	13/63 (.21)	14/66 (.21)	37/187 (.20)	0.02	.884	1.05 [0.52, 2.14]	0.02 [-0.26, 0.31]
Scenario 3: Investment portfolios							
Mod. Risk	22/64 (.34)	15/63 (.24)	43/189 (.23)	3.38	.066	1.78 [0.96, 3.30]	0.26 [-0.02, 0.54]
High Risk	9/64 (.14)	7/63 (.11)	17/189 (.09)	1.33	.249	1.66 [0.70, 3.92]	0.16 [-0.12, 0.44]
Treasury	36/62 (.58)	27/63 (.43)	79/191 (.41)	5.27	.022	1.96 [1.10, 3.51]	0.34 [0.05, 0.62]
Municipal	21/63 (.33)	14/63 (.22)	26/190 (.14)	12.08	.001	3.15 [1.62, 6.15]	0.47 [0.19, 0.76]
Scenario 4: College jobs							
College A	16/63 (.25)	10/62 (.16)	16/191 (.08)	12.46	< .001	3.72 [1.73, 7.99]	0.47 [0.18, 0.75]
College B	33/65 (.51)	23/62 (.37)	43/189 (.23)	18.11	< .001	3.50 [1.93, 6.34]	0.59 [0.31, 0.87]
College C	36/63 (.57)	18/62 (.29)	41/191 (.21)	28.54	< .001	4.88 [2.66, 8.95]	0.75 [0.47, 1.04]
College D	23/63 (.37)	11/62 (.18)	46/191 (.24)	3.70	.055	1.81 [0.98, 3.34]	0.27 [-0.01, 0.56]

Note. SQ = status quo, N = neutral, NSQ = non-status quo

Again, we conducted independent-proportions test to examine H_1 and H_2. The status quo framing resulted in significantly higher choice rates for nearly all options from Scenario 1, regardless of whether it was compared against the non-status quo framing ($\chi^2 \geq 10.81$, $ps \leq .001$, lowest odds ratio = 2.78, 95% CI [1.49, 5.17], lowest Cohen's $h = 0.46$, 95% CI [0.17, 0.74]) or against the neutral framing (for those significant differences: $\chi^2 \geq 4.97$, $ps \leq .026$, lowest odds ratio = 2.40, 95% CI [1.10, 5.21], lowest Cohen's $h = 0.40$, 95% CI [0.05, 0.74]). The only exception was the "50A50H" option, for which the comparison between the status quo framing and the neutral framing did not result in a significant difference, $\chi^2 = 2.64$, $p = .104$; though the effect was in the predicted direction, odds ratio = 1.79, 95% CI [0.88, 3.64], Cohen's $h = 0.29$, 95% CI [-0.06, 0.64].

Table 4.

Status quo framing vs. neutral framing (2nd phase)

Options	Choice rates			Status quo framing vs. neutral framing			
	SQ	N	NSQ	χ^2	*p*	Odds ratio (95% CI)	Cohen's *h* (95% CI)
Scenario 1: Budget allocation ratios							
70A30H	18/63 (.29)	8/65 (.12)	20/188 (.11)	5.23	.022	2.85 [1.14, 7.15]	0.41 [0.06, 0.76]
30A70H	35/62 (.56)	11/65 (.17)	38/189 (.20)	21.46	< .001	6.36 [2.80, 14.45]	0.85 [0.50, 1.20]
60A40H	25/63 (.40)	14/65 (.22)	36/188 (.19)	4.97	.026	2.40 [1.10, 5.21]	0.40 [0.05, 0.74]
50A50H	40/63 (.63)	32/65 (.49)	36/125 (.29)	2.64	.104	1.79 [0.88, 3.64]	0.29 [-0.06, 0.64]
Scenario 2: Wagon colors							
Red	19/61 (.31)	15/66 (.23)	24/189 (.13)	1.15	.284	1.54 [0.70, 3.39]	0.19 [-0.16, 0.54]
Silver Blue	33/66 (.50)	31/66 (.47)	99/184 (.54)	0.12	.728	1.13 [0.57, 2.24]	0.06 [-0.28, 0.40]
Tan	10/60 (.17)	6/66 (.09)	15/190 (.08)	1.63	.202	2.00 [0.68, 5.89]	0.23 [-0.12, 0.58]
White	13/63 (.21)	14/66 (.21)	37/187 (.20)	0.01	.936	0.97 [0.41, 2.26]	-0.01 [-0.36, 0.33]
Scenario 3: Investment portfolios							
Mod. Risk	22/64 (.34)	15/63 (.24)	43/189 (.23)	1.72	.190	1.68 [0.77, 3.64]	0.23 [-0.11, 0.58]
High Risk	9/64 (.14)	7/63 (.11)	17/189 (.09)	0.25	.616	1.31 [0.46, 3.76]	0.09 [-0.26, 0.44]
Treasury	36/62 (.58)	27/63 (.43)	79/191 (.41)	2.89	.089	1.85 [0.91, 3.75]	0.31 [-0.05, 0.66]
Municipal	21/63 (.33)	14/63 (.22)	26/190 (.14)	1.94	.164	1.75 [0.79, 3.86]	0.25 [-0.10, 0.60]
Scenario 4: College jobs							
College A	16/63 (.25)	10/62 (.16)	16/191 (.08)	1.63	.202	1.77 [0.73, 4.28]	0.23 [-0.12, 0.58]
College B	33/65 (.51)	23/62 (.37)	43/189 (.23)	2.41	.121	1.75 [0.86, 3.55]	0.28 [-0.07, 0.62]
College C	36/63 (.57)	18/62 (.29)	41/191 (.21)	10.06	.002	3.26 [1.55, 6.84]	0.58 [0.23, 0.93]
College D	23/63 (.37)	11/62 (.18)	46/191 (.24)	5.56	.018	2.67 [1.16, 6.11]	0.43 [0.08, 0.78]

Note. SQ = status quo, N = neutral, NSQ = non-status quo

Although most options from Scenario 3 and 4 exhibited the hypothesized pattern, the results of our independent-proportions tests did not consistently meet the criterion for statistical significance. There was only one option (College C in Scenario 4) for which both comparisons (i.e., status quo vs. non-status quo and status quo vs. neutral) yielded statistically significant differences. There were two options (Moderate Risk and High Risk in Scenario 2) for which both differences were not significant. Comparing the status quo framing with the non-status quo framing, the effect sizes ranged from 1.66 to 3.15 in odds ratio or 0.16 to 0.47 in Cohen's *h* in Scenario 3, and from 1.81 to 4.88 in odds ratio or 0.27 to 0.75 in Cohen's *h* in Scenario 4. Comparing the status quo framing with the neutral framing, the effect sizes ranged from 1.31 to 1.85 in odds ratio or 0.09 to 0.31 in Cohen's *h* in Scenario 3, and from 1.75 to 3.26 in odds ratio or 0.23 to 0.58 in Cohen's *h* in Scenario 4. Despite those non-significant differences, our data still provide good support overall for the status quo bias in these two scenarios. The bias seemed to be more pronounced in Scenario 4 than in 3 based on the observed effect sizes.

Like in the first-phase replication, we found the least support for the status quo bias in Scenario 2. Two options from this scenario did not exhibit the hypothesized pattern. For silver blue, the non-status quo framing even led to higher choice rate than the

status quo framing. Comparing the status quo framing with the non-status quo framing, we observed significant differences for two options (for the tan color: odds ratio = 2.33, 95% CI [0.99, 5.51], Cohen's h = 0.27, 95% CI [-0.02, 0.56]; for the red color: odds ratio = 3.11, 95% CI [1.56, 6.20], Cohen's h = 0.46, 95% CI [0.17, 0.74]). Comparing the status quo framing with the neutral framing, all differences were non-significant, with the option of tan color exhibiting the largest effect size (odds ratio = 2.00, 95% CI [0.68, 5.89], Cohen's h = 0.23, 95% CI [-0.12, 0.58]). Overall, our data provided limited support for the status quo bias in Scenario 2.

Table 5.

Comparing the replication findings with the original findings (status quo framing vs. non-status quo framing)

Option	Original effect size	Replication effect size	Interpretation
First-phase replication			
Scenario 1			
70A30H	0.78 [0.42, 1.14]	0.62 [0.34, 0.91]	Signal – consistent
30A70H	0.54 [0.10, 0.99]	0.55 [0.25, 0.84]	Signal – consistent
60A40H	0.79 [0.30, 1.28]	0.61 [0.32, 0.89]	Signal – consistent
50A50H	0.18 [-0.20, 0.57]	0.44 [0.16, 0.73]	Signal – consistent
Scenario 2			
Red	0.84 [0.51, 1.18]	-0.03 [-0.32, 0.26]	No signal – inconsistent
Silver Blue	0.56 [0.21, 0.90]	-0.03 [-0.32, 0.25]	No signal – inconsistent
Tan	0.45 [0.09, 0.81]	-0.02 [-0.31, 0.27]	No signal – inconsistent
White	0.51 [0.19, 0.83]	0.23 [-0.06, 0.51]	No signal – consistent
Second-phase replication			
Scenario 1			
70A30H	0.78 [0.42, 1.14]	0.46 [0.18, 0.75]	Signal – inconsistent, smaller
30A70H	0.54 [0.10, 0.99]	0.77 [0.48, 1.06]	Signal – consistent
60A40H	0.79 [0.30, 1.28]	0.46 [0.17, 0.74]	Signal – inconsistent, smaller
50A50H	0.18 [-0.20, 0.57]	0.71 [0.41, 1.01]	Signal – inconsistent
Scenario 2			
Red	0.84 [0.51, 1.18]	0.46 [0.17, 0.74]	Signal – inconsistent, smaller
Silver Blue	0.56 [0.21, 0.90]	-0.08 [-0.36, 0.21]	No signal – inconsistent
Tan	0.45 [0.09, 0.81]	0.27 [-0.02, 0.56]	No signal – consistent
White	0.51 [0.19, 0.83]	0.02 [-0.26, 0.31]	No signal – inconsistent
Scenario 3			
Mod. Risk	0.21 [-0.30, 0.71]	0.26 [-0.02, 0.54]	No signal – consistent
High Risk	0.16 [-0.26, 0.58]	0.16 [-0.12, 0.44]	No signal – consistent
Treasury	0.29 [-0.09, 0.67]	0.34 [0.05, 0.62]	Signal – consistent
Municipal	0.57 [0.08, 1.07]	0.47 [0.19, 0.76]	Signal – consistent
Scenario 4			
College A	0.17 [-0.17, 0.51]	0.47 [0.18, 0.75]	Signal – inconsistent, larger
College B	0.12 [-0.31, 0.56]	0.59 [0.31, 0.87]	Signal – inconsistent, larger
College C	0.74 [0.26, 1.21]	0.75 [0.47, 1.04]	Signal – consistent
College D	0.52 [0.11, 0.93]	0.27 [-0.01, 0.56]	No signal – consistent

Note. Effect sizes are in Cohen's h. Interpretations are based on LeBel et al. (2019, p. 4).

Table 6.

Comparing the replication findings with the original findings (status quo framing vs. neutral framing)

Option	Original effect size	Replication effect size	Interpretation
First-phase replication			
Scenario 1			
70A30H	0.74 [0.27, 1.21]	0.57 [0.22, 0.92]	Signal – consistent
30A70H	0.30 [-0.25, 0.84]	0.19 [-0.16, 0.54]	No signal – consistent
60A40H	0.34 [-0.24, 0.92]	0.52 [0.17, 0.87]	Signal – consistent
50A50H	0.25 [-0.24, 0.74]	0.38 [0.03, 0.73]	Signal – consistent
Scenario 2			
Red	0.67 [0.17, 1.17]	-0.25 [-0.60, 0.10]	No signal – inconsistent
Silver Blue	0.51 [0.00, 1.02]	-0.05 [-0.40, 0.30]	No signal – inconsistent
Tan	0.14 [-0.37, 0.66]	0.00 [-0.35, 0.35]	No signal – consistent
White	0.25 [-0.24, 0.74]	0.41 [0.06, 0.76]	Signal – consistent
Second-phase replication			
Scenario 1			
70A30H	0.74 [0.27, 1.21]	0.41 [0.06, 0.76]	Signal – consistent
30A70H	0.30 [-0.25, 0.84]	0.85 [0.50, 1.20]	Signal – inconsistent, larger
60A40H	0.34 [-0.24, 0.92]	0.40 [0.05, 0.74]	Signal – consistent
50A50H	0.25 [-0.24, 0.74]	0.29 [-0.06, 0.64]	No signal – consistent
Scenario 2			
Red	0.67 [0.17, 1.17]	0.19 [-0.16, 0.54]	No signal – inconsistent
Silver Blue	0.51 [0.00, 1.02]	0.06 [-0.28, 0.40]	No signal – inconsistent
Tan	0.14 [-0.37, 0.66]	0.23 [-0.12, 0.58]	No signal – consistent
White	0.25 [-0.24, 0.74]	-0.01 [-0.36, 0.33]	No signal – consistent
Scenario 3			
Mod. Risk	0.14 [-0.45, 0.73]	0.23 [-0.11, 0.58]	No signal – consistent
High Risk	0.23 [-0.29, 0.75]	0.09 [-0.26, 0.44]	No signal – consistent
Treasury	0.26 [-0.21, 0.73]	0.31 [-0.05, 0.66]	No signal – consistent
Municipal	0.31 [-0.27, 0.90]	0.25 [-0.10, 0.60]	No signal – consistent
Scenario 4			
College A	0.28 [-0.11, 0.66]	0.23 [-0.12, 0.58]	No signal – consistent
College B	0.41 [-0.08, 0.90]	0.28 [-0.07, 0.62]	No signal – consistent
College C	0.26 [-0.26, 0.79]	0.58 [0.23, 0.93]	Signal – consistent
College D	0.53 [0.07, 1.00]	0.43 [0.08, 0.78]	Signal – consistent

Note. Effec sizes are in Cohen's *h*. Interpretations are based on LeBel et al. (2019, p. 4)

Comparing replication to original findings

A comparison between the original findings (Table 2S and 3S in the supplementary; Samuelson & Zeckhauser, 1988, p. 17) and our replication findings suggests that our replication of the status quo bias in Scenario 1, 3, and 4 can be considered successful. Based on LeBel et al.'s (2019) criteria for evaluating replication results (see Table 5 and 6, and Figure 1S in the supplementary), our replication effects in these scenarios were either signals (i.e., significant results) in the expected direction or non-signals that were consistent with the original effects (i.e., the CIs covered the original effects). The replication effect sizes were in general comparable with (Scenario 1 and 3), or larger than (Scenario 4), the original

effect sizes. A major discrepancy, however, was found in Scenario 2. Whereas the target study found a significant status quo bias for all options in this scenario (lowest Cohen's h = 0.45 in the status quo vs. non-status quo comparison), our data did not reveal any consistently significant status quo bias (status quo vs. non-status quo) for any option across the two phases of replications. The largest effect size was Cohen's h = 0.46 (for the red option in the second phase).

The comparisons between the status quo framing and the neutral framing did not reveal consistently significant differences in any of the scenarios in the original study. In contrast, our replication data revealed consistently significant differences for Scenario 1 options (except for the "30A70H" option in the first phase and the "50A50H" option in the second phase). Meanwhile, in line with the original results, we observed a general pattern across Scenarios 1, 3, and 4 that choice rates of options under the status quo framing were higher than under the neutral framing. Scenario 2 results, however, had the largest discrepancy when compared with the original results. The original study observed two significant differences when the status quo framing was compared with the neutral framing, whereas in our replications, only the white color option in the first-phase replication had a significant difference in the status quo vs. non-status quo comparison. Moreover, we had three comparisons that yielded effects in the opposite direction (red and silver blue in the first phase and white in the second phase). Overall, our replication findings for Scenario 2 deviated the most from the original.

Discussion

We conducted two phases of pre-registered replications of the status quo bias, focusing on four hypothetical decision scenarios from Samuelson and Zeckhauser (1988). Our results were mostly consistent with the original findings. We found support for the status quo bias in three scenarios but weak-to-no support in the remaining one (i.e., Scenario 2). In addition, our results suggest that the magnitude of the bias varied depending on the decision-making scenarios. We observed the strongest bias in Scenario 1, followed by 4 and 3. In what follows, we discuss possible factors that might have resulted in the varying magnitudes across the scenarios.

Factors affecting status quo bias

The perceived cost of a change and uncertainties associated with its outcome could affect the status quo bias (Anderson, 2003; Iyengar & Lepper, 2000). In Scenario 2, which was about choosing the color for one's preordered wagon, the perceived cost of a change should be almost zero even if decision-makers seriously take that into consideration; all it takes for a change is a word to the wagon dealer. In addition, there is little uncertainty associated with such a change. Based on the description of the scenario, once a person opts for a change, the person is sure to get the color that he or she prefers. In contrast, for the other scenarios, there was still room for decision-makers to infer transition costs that were not explicitly ruled out in the descriptions. These costs could be material or mental. For example, the status quo versions of Scenario 4 asked whether one would choose to remain in the current job at a college or to accept a job offer from other colleges at different locations. In this scenario, participants could have inferred the cost of moving and re-establishing personal networks. It is also highly uncertain whether the job that one switches to would be satisfactory, as real-life experience tells us that job satisfaction can be influenced by numerous unforeseen factors. Scenario 3 could be an example for potential mental costs. Faced with different investment portfolios, those who were less willing to engage in effortful thinking (i.e., calculating the expected gains for each of the options and comparing them) for various reasons (e.g., they may think they lack the expertise) would be prone to stick with the status quo. The need to calculate expected gains also implies risks and uncertainty. Overall, Scenario 2 stood in sharp contrast with the other three scenarios with respect to the perceived cost of changes and uncertainties associated with the outcomes, which might have resulted in our failure of replicating the status quo bias with the scenario.

Arguably, Scenario 1, which was about an impactful public financial decision, involved more concerns (and hence more room for inferred cost of a change) and a higher level of uncertainty than the other sce-

narios. Therefore, participants showed the strongest and most robust status quo bias in this scenario. Also, that it was related to a public financial decision might have implied that the status quo has passed many other people's scrutiny, leading to little perceived need for a change and hence a larger status quo bias (Simon, 1956). Our measures and data, however, did not allow formal tests of these claims.

Existence and longevity biases, which were said to underlie our preference for the status quo (Eidelman & Crandall, 2012, 2014), could also explain the varying sizes of the status quo bias across the scenarios. It was explicitly stated in the description of Scenario 2 that the status quo color option was set two days ago ("Two days ago, the dealer called saying that a red wagon was available."). This relatively shorter period of existence (as compared with the status quo options in other scenarios, though how long those options have existed was not specified) could have been a reason why the status quo bias was trivial in Scenario 2.

It is plausible to argue that participants were not so motivated to maintain the status quo in Scenario 2 given how the scenario was constructed. The status quo option, i.e., the color option that the wagon dealer said to be the only one available, was more a compelled rather than an autonomous choice. Forgoing the choice and switching to an alternative, therefore, would produce little cognitive dissonance, which was thought to be a reason why the status quo is maintained and defended (Eidelman & Crandall, 2014; Festinger, 1962; Jost et al., 2004; Kay et al., 2009). Additionally, in Scenario 2, the decision-maker was yet to own the wagon when he or she made the decision about whether to switch or not; therefore, loss aversion should have little role in producing a status quo bias in that scenario.

Per the self-perception account of the status quo bias, people exhibit stronger bias for the status quo when they perceive it to reflect their own preferences and needs (Bem, 1972; Eidelman & Crandall, 2014; Samuelson & Zeckhauser, 1988). And the need for consistency drives us to maintain the status quo. From this perspective, there could be two reasons for the weak-to-no status quo preference in Scenario 2. First, as said above, the status quo color option in Scenario 2 was more like a compelled choice. Recognizing this, participants would not think that they made the initial decision based on their preferences ("I was only given that option by the wagon dealer. I had no choice."). Consequently, there was no reason or motivation for them to stick with the status quo option if they found the alternatives more attractive. Second, preferences for colors are arguably more accessible than preferences for investment portfolios (Scenario 3), job offers (Scenario 4), and safety research programs (Scenario 1). Most people have clearer preferences for colors than for the other things. When prompted, they can tell color preferences more quickly, firmly, and with reasons that are more subjective (e.g., "I like this color just because of personal aesthetics"). Strong prior preferences are a major hinderance for context effects on decision-making because they lead people to ignore contextual factors and make decisions based on their own likes and dislikes (Huber et al., 2014). Our results for Scenario 2, therefore, were consistent with the claim that people exhibit a weaker status quo bias if some alternative appears substantially more appealing than its counterparts.

Limitations and future directions

We were limited by our inability to experimentally control or manipulate the factors that we discussed above, since we aimed primarily at direct replications. Still, we did not attempt to replicate the original experiment in full, leaving out some original scenarios and using only the four-option versions. To what extent the original results for the other scenarios and other types of decision questions (e.g., Question 7 and 8 that provided a continuum of options; Part Two that elicited sequential decisions from participants) can be replicated, and whether the claim that the more options there are, the stronger the status quo bias is remains supported across scenarios (see, e.g., Redelmeier & Shafir, 1995), are questions worth addressing in future studies. To be precise, what we attempted to replicate was the effect of status quo framing, since our experiments did not involve participants' actual previous choices. Therefore, more evidence is needed if our findings are to be generalized to situations where actual previous choices serve as the status quo.

Direct replications of the classic and influential findings of Samuelson and Zeckhauser (1988) served to assess whether their results were reliable and robust across time, samples, and experimental settings. Examining how different factors moderate the

status quo bias, however, was beyond the scope of our investigation. Future research on the status quo bias can measure or control for potential moderators and explore the circumstances that influence the manifestation and magnitude of the bias.

The value of direct replications, particularly of those on what are perceived to be old and well-established phenomena, is often questioned. However, as psychology is shifting its focus away from identification of effects to provision of accurate effect size estimates (Cumming, 2014), we believe more direct replications should be conducted, especially those on classic effects. Only by aggregating, or meta-analyzing, enough similar studies can we obtain an accurate estimate of the size of a particular effect and have an informed expectation on the outcome when the effect is to be applied in the real world. The discrepancy that we revealed between the original results and our findings does not invalidate the overall claim about the existence of the status quo bias; nonetheless, we recommend caution regarding the claim that the bias is pervasive in decision-making scenarios (e.g., Samuelson & Zeckhauser, 1988, p. 41). Our findings also highlight the need for more direct replications (ideally in the form of multi-lab collaborative Registered Reports; Klein et al., 2018; Nosek & Lakens, 2014) on classic findings, some of which were based on insufficiently powered experiments using unrepresentative university student samples. Subjecting evidence obtained in original studies and in replications to meta-analyses, we will be able to obtain more comprehensive and precise pictures of existing psychological effects and their boundary conditions.

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Author Contributions

G.F. supervised each step of this project, conducted the pre-registrations, and collected the data. M.P. initiated the project and designed and analyzed the first phase of this replication project, as part of his Master dissertation. C.S.L. reviewed and reanalyzed the first phase of the replication and initiated, designed, and analyzed the data from the second phase. Q.X. reviewed the pre-registrations, verified all data analyses, and drafted the manuscript. Q.X. and G.F. jointly finalized the manuscript for submission. Please refer to the supplementary for author contribution based on Contributor Roles Taxonomy (CRediT).

Additional Information

The current replication is part of the larger "mass pre-registered replications in judgment and decision-making" project led by G.F. The project aims to revisit well known research findings in the field of judgment and decision-making (JDM) and investigate the replicability of those findings. More information is available on: http://mgto.org/pre-registered-replications.

Open Science Practices

This article earned the Preregistration, Open Data and the Open Materials badge for preregister-

ing the hypothesis and analysis before data collection, and for making the data and materials openly available. It has been verified that the analysis reproduced the results presented in the article. The entire editorial process, including the open reviews, are published in the online supplement.

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