Reference points and decision-making:
Impact of status quo and defaults in a
conceptual replication and extensions
Registered Report of Dinner et al. (2011)
[Stage 1]

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Moon Ling Monique Yam conducted the replication as part of her thesis in psychology.

Gilad Feldman guided the project, supervised each step in the project, ran data collection, conducted the pre-registration, and edited the manuscript for submission.

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**Important links and information**

Citation of the target research article:

Dinner, I., Johnson, E. J., Goldstein, D. G., & Liu, K. (2011). Partitioning default effects: why people choose not to choose. *Journal of Experimental Psychology*. Applied, 17(4), 332–341. <https://doi.org/10.1037/a0024354>

## Contributor Roles Taxonomy

|  |  |  |
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| **Role** | **Moon Ling Monique Yam** | **Gilad Feldman** |
| Conceptualization | X | X |
| Pre-registration |  | X |
| Data curation |  | X |
| Formal analysis | X |  |
| Funding acquisition |  | X |
| Investigation  | X |  |
| Pre-registration peer review / verification |  | X |
| Data analysis peer review / verification |  | X |
| Methodology | X |  |
| Project administration |  | X |
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| Software | X |  |
| Supervision |  | X |
| Validation |  | X |
| Visualization | X |  |
| Writing-original draft | X |  |
| Writing-review and editing |  | X |

#  Abstract

[IMPORTANT:

Abstract, method, and results were written using a randomized dataset produced by Qualtrics to simulate what these sections will look like after data collection. These will be updated following the data collection. For the purpose of the simulation, we wrote things in past tense, but no pre-registration or data collection took place yet.]

Status quo bias is the phenomenon that people tend to prefer to stick with the status quo over change, even when change may be more beneficial. In a Registered Report with an American online Amazon Mechanical Turk sample using CloudResearch (*N* = 1500), we conducted a replication and extensions of Experiments 1 and 2 from Dinner et al. (2011).
[The following findings are concluded from simulated random noise and will be updated after data collection.]
We found …

Extending the replication, we found …

We conclude …

Materials, data, and code are available on: <https://osf.io/n9zp4/> .

*Keywords:* status quo bias, bias, judgment and decision making, registered replication, default effect, reference points, choice architecture

#

# PCIRR-Study Design Table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Question | Hypothesis | Sampling plan | Analysis plan | Rationale for deciding the sensitivity of the test | Interpretation given different outcomes | Theory that could be shown wrong by the outcomes |
| Is there support for status quo bias (tendency to follow the existing status)? | Status quo impacts decisions and preferences in the direction of the status quo. | We aimed to recruit 1500 participants.See power and sensitivity analyses section | Chi-square tests, and two-way logistic regression (dichotomous measures) and factorial ANOVA (continuous measures) | We followed analysis and effects reported in the original article with much higher power to detect effects.Alpha of 5% followed the target’s, and high power of 95% is on par and higher than typical replications in PCIRR.See power and sensitivity analyses section | We examine the replicability of Dinner et al. (2011) based on the replication criteria used by Lebel et al. (2019) | Status quo bias |
| Is there support for a default effect (tendency to follow the pre-selected option)?  | Default option impacts decisions and preferences in the direction of the default. | Default effect |
|  |  |  |
| Are status quo bias and default effects additive or do they interact? | There is an interaction between status quo and default in impacting decisions and preferences.Preference is strongest when the two factors align.  | Norm theory and reference points.  |
| How are status quo and default related to perceived effort, endorsement, and reference comparisons?  | Perceived effort is associated with change from status quo and from default.Direct and indirect implied endorsements are associated with defaults and status quo.  | Pearson correlation  |  |

# Reference points and decision-making: Impact of status quo and defaults in a conceptual replication and extensions Registered Report of Dinner et al. (2011) [Stage 1]

[IMPORTANT:
Section is written in the past tense to simulate what the manuscript will look like after data collection, yet no pre-registration or data collection took place.]

## Background

Status quo bias is the phenomenon that when faced with a choice of whether to maintain the current state of affairs or make a change, people tend to show greater preference for the status quo. Dinner et al. (2011) demonstrated the status quo bias in environmental purchasing decisions in the context of household renovations. They examined three potential factors underlying the tendency to follow the status quo: perceived implied endorsement - that the status quo is perceived as the recommended options, perceived effort - that the status quo is perceived as less effortful, and reference dependence - that people use the status quo as a reference point. The focus was on the reference points factor, with the conclusion that reference dependence indeed plays an important role in strengthening tendencies towards the status quo.

We embarked on a conceptual replication building on the work by Dinner et al. (2011) with the following goals. The first goal was to conduct an independent replication of status quo bias using Dinner et al. (2011)’s paradigm, examining underlying factors of endorsement and effort. Our second goal was to disentangle the conflation in the target regarding reference points, by differentiating between the effects of status quo and defaults, manipulating the two factors to examine their separate and combined impact on choices and preferences.

We begin by discussing the need to differentiate and disentangle the default effect and status quo bias, clarifying the target article’s focus was on status quo bias rather than default effects. We then review the literature on status quo bias and the chosen article for replication - Dinner et al. (2011), and then introduce our extensions and adjusted design.

## Differentiating between default bias from status quo bias

Dinner et al. (2011) referred to their phenomenon of interest as “default effect”, as their article is titled: “Partitioning Default Effects: Why People Choose Not to Choose”. Yet, when we embarked on this project and examined their methods and study design, we realized that what they had in fact tested was “status quo bias”. Defaults and status quo both are about reference points, yet they are separate effects that are often mislabeled, confounded, and confused for one another, even by the very researchers who coined these terms (Shevchenko et al., 2014). In their review of reference point biases, Feldman et al. (2020) attempted to make clear the differences between the two effects: Default effect is the tendency to choose the default option set in a given choice set (Johnson & Goldstein, 2003), whereas status quo bias is the tendency to not change from the option that already exists de-facto and serves as the status quo (Baron & Ritov, 2009; Eidelman & Crandall, 2012). There are links between the two, status quo is often perceived as the default course of action, yet the two can diverge as there are times when the presented default would be to change from the status quo.

 The distinction between the two biases seems especially important given that the impact of the two biases may vary depending on the context of the decision-making situation. Default options seem to be better suited for form or survey decisions in making certain options more salient, guiding decision-makers towards a recommended option, or helping those with decision fatigue or reluctance to choose to default towards a choice that policy makers would deem as the one best suited for them. For example, defaults have been shown to help guide patients’ end-of-life choices (Halpern et al., 2013). Status quo bias seems to convey previous personal or external decisions that can be used to guide or justify current decisions, signaling that the option has had merit and/or has been vetted and tested, such as in evaluating new technologies (Smiley & Fisher, 2022). Changing from the status quo typically requires much more effort and investment than does selecting the non-default option.

Contrasting the two biases against one another could help better understand whether the two biases are complementary or supplementary to one another, and which one of the two is stronger. If, for example, status quo is found to be the stronger among the two, then labeling status quo biases as default effects may lead to an overestimation of default effects and disappointment when implementing default options in real life.

In their article, Dinner et al. (2011) examined the impact of manipulated pre-installed lightbulbs that define the current status, rather than the manipulation of the displayed defaults in the provided choice-set between the two lightbulb options. Therefore, we consider their article as being about status quo bias and not about default effect. Hence, we proceed to discuss their theory and findings as being about the status quo bias, despite them mostly referring to the default effect in their article and their review of the literature.

We note that status quo bias and default effects are considered some of the most common and impactful nudge factors affecting behavioral change. Nudges or nudge interventions are an umbrella term referring to the many ways by which changes to choice-architecture may affect people’s judgments and behavior while still preserving people’s autonomy of decision making (Thaler & Sunstein, 2009).

## Status quo bias

*Status quo bias* refers to the general tendency to stick with the status quo, a previously chosen option, even when presented with alternative choices that are better value and/or better aligned with one’s goals (Samuelson & Zeckhauser, 1988; Xiao et al., 2021). Status quo could be a result of an individual choice or an externally set option. An example of the status quo bias is a person who has been enrolled in a health insurance plan for several years (either self-enrolled or enrolled automatically by their employer) and does not act to change to a new plan that guarantees better coverage and cheaper installments with less risk. Beyond the decision to stay with the familiar health insurance plan, a person might also be reluctant to explore other options or to even show resistance towards considering alternative plans. Therefore, the status quo bias may take the form of both action (resistance, opposition, reluctance, etc.) and inaction (not checking status, not changing, not exploring, etc.). For an in-depth discussion of the differences between status-quo bias and other action-inaction biases see review by Feldman and colleagues (2020).

Past research suggested several possible explanations for the status quo bias: 1) defaults, 2) effort, familiarity, certainty, and risk 3) endowment (Dinner et al., 2011; Johnson & Goldstein, 2003; Samuelson & Zeckhauser, 1988; Tversky & Kahneman, 1991).

First, when there are no defaults set and there are no external shocks prompting a change, the status quo seems to serve as the default, in that the status quo will be maintained by default unless an action is taken. Second, the status quo requires no additional effort or thought, and represents the more familiar, stable, and lower risk option on which the person has accumulated information, whereas change from the status quo often requires cognitive effort to seek out new information on the alternative options, understand the new options, and to be able to assess risk and overcome uncertainty. Third, the endowment effect suggests that people tend to weigh what they have as more valuable compared with what they do not have (Kahneman et al., 1991). Following this logic, status quo may be perceived as an endowment, leading to being perceived as higher value, and switching from status quo invoking loss aversion.

## Choice of study for baseline design: Dinner et al. (2011)

We chose the studies by Dinner et al. (2011) as the basis for our investigation due to their impact and the potential for theoretical and empirical improvements for clarifying the phenomenon.

The article has had a major impact on scholarly research in the area of judgment and decision making and behavioral economics. The work by Dinner et al. (2011) holds clear practical implications, as it shows status quo biases in common contexts impacting issues of sustainability, and testing mechanisms of endorsement, effort, and reference points as explaining the phenomenon. At the time of writing (May 2023), there were 375 Google Scholar citations of the article with many important follow-up theoretical and empirical articles. Examples include Johnson et al. (2012) on choice architecture tools in shaping one’ decision making processes, Acquisti et al. (2016) on nudge intervention regarding to online privacy and security decision-making, and Spälti et al. (2017) on the impact of status quo on memory retrieval processes and preference formation in voting behavior.

We thought it especially important to revisit this target article given the conceptual conflation of status quo and defaults, and the need we saw to disentangle the two. To the best of our knowledge there are currently no published independent replications of this article, and no studies contrasting and examining interactions between status quo and default effects.

Given the growing recognition of the importance of reproducibility and replicability in psychological science (e.g., Brandt et al., 2014; Open Science Collaboration, 2015; Nosek et al., 2022; Zwaan et al., 2018), we embarked on a well-powered replication and extension Registered Report of Dinner et al. (2011).

## Original hypotheses and findings in target article: Dinner et al.

The article by Dinner et al. (2011) consisted of three experiments, and we chose to focus on Study 1 and Study 2. In those studies, they recruited adult participants from an online national panel to examine the presence of status quo bias using a common home renovation scenario. In that scenario they manipulated the pre-installed light bulbs (Incandescent light bulbs or Compact fluorescent light bulbs). Participants were asked to decide whether to keep the pre-installed light-bulbs, or to switch to the other option, with measures examining perceived implied endorsement (direct, indirect) and perceived effort during the decision making process. They also added indirect measures of “reference dependence”, the shift in reference point, which they examined through aspect listing protocol and examining order content.

We chose to focus on the first two studies as the baseline demonstration of the phenomenon, and the measures of endorsements and effort. We chose not to implement “reference dependence” manipulations of order and content, as we wanted to first try and disentangle the status quo effect from default effect.

We summarized the hypotheses of the target article in Table 1, and their tests and findings in Table 2.

Table 1

*Summary of replication and extension of the target article*

|  | Hypotheses | Description  |
| --- | --- | --- |
| Conceptual replication of Studies 1 and 2 | 1 | Status quo bias: People are more likely to choose the status quo option.  |
| 2a | Switch from status quo is positively associated with *perceived effort*. |
| 2b | Status quo is positively associated with *direct implied endorsement.* |
| 2c | Status quo is positively associated with *indirect implied endorsement*.  |
| Extensions | 3 | Default effect: People are more likely to choose the default option. |
|  |  |
| 4 | Competing exploratoryInteractions: Status quo and default interact in impacting choice (and factors). No interactions: Status quo and default are additive - they all separately impact choice (and factors).  |

Table 2

*Dinner et al. (2011) Studies 1 and 2: Summary of findings*

|  |
| --- |
| **Experiment 1 (*N*=209)**  |
| **Dependent Variables** | **χ2** | **Cohen's w** | **CIL** | **CIH** | **df** | ***p*** |
| Choosing the status quo option | 12.3 | 0.24 | 5.43 | 19.17 | 1 | <.01 |
| Perceived effort | 0.41 | 0.04 | -0.85 | 1.67 | 1 | .52 |
| Direct implied endorsement | 2.36 | 0.11 | -0.65 | 5.37 | 1 | .12 |
| Indirect implied endorsement | 0.32 | 0.04 | -0.79 | 1.43 | 1 | .57 |
| **Experiment 2 (*N*=126)**  |
| **Dependent Variables** | **χ2** | **Cohen's w** | **CIL** | **CIH** | **df** | ***p*** |
| Choosing the status quo option | 6.98 | 0.24 | 1.80 | 12.16 | 1 | <.01 |
| Perceived effort | 9.24 | 0.27 | 3.28 | 15.20 | 1 | <.01 |
| Decision time | 0.35 | 0.05 | -0.81 | 1.51 | 2 | .55 |
| Direct Implied Endorsement | 0.25 | 0.04 | -0.73 | 1.23 | 1 | .61 |
| Indirect Implied Endorsement | 0.05 | 0.02 | -0.39 | 0.488 | 1 | .82 |

*Note*. CIL = lower bounds for CIs. CIH = higher bounds of CIs. All tests are Logistic regressions. Effect sizes and confidence intervals were not reported in the target and are based on our reconstructed calculations.

##

## Overview of replication and extension

We used Dinner et al.’s (2011) choice-set and decision task as our baseline for examining status quo bias. They constructed a scenario presenting a choice between two types of lightbulbs, a cheap yet inefficient Incandescent (INC) bulb against a Compact Fluorescent (CFL) more expensive greener bulb. They manipulated the status quo - which light bulbs have already been pre-installed, and measured perceived direct endorsement, indirect endorsement, and effort.

In the decade since the target article was published, the environmental regulatory landscape in the United States has changed dramatically, phasing out INC light bulbs and currently planning on phasing out CFL in favor of the more expensive greener Light Emitting Diode (LED) bulb. We therefore adjusted the INC vs. CFL choice task to CFL vs. LED choice task.

We further extended their scenario and paradigm and added a control condition for status quo, resulting in a status quo manipulation of CFL vs. LED vs. none. We then added an additional independent variable factor manipulating defaults: control with no default vs. CFL default vs. LED default.

### Default effects

Defaults refer to the option that has been pre-selected in a decision situation choice-set. The decision maker is free to shift to any other option at little to no cost, meaning that if the decision maker proceeds without making any voluntary action then the default option will be selected. Defaults are a common tool used in constructing policy choices, as it still preserves freedom for the decision-maker to choose alternative choices (Thaler & Sunstein, 2009). Setting default choices tends to increase the likelihood of choosing the default choices.

A common example of defaults is opt-out programs, where individuals are automatically enrolled unless they actively ask to opt-out (Johnson & Goldstein, 2003; Chandrashekar et al., 2023). Studies have shown default effects in various contexts, from donations (Briscese, 2019) and electricity pricing policy (Fowlie et al., 2021) to consumer decisions (Johnson et al., 2013). Several recent meta-analyses concluded default effect as having medium to strong effects, and among the strongest of the nudge interventions (Hummel & Maedche, 2019; Mertens et al., 2022a; Jachimowicz et al., 2019) though follow-up critics showed that the literature is heavily affected by publication bias and that effects adjusted for that seem much weaker (Maier et al., 2022; Szaszi et al., 2022). The debate about the robustness of nudge and default effects is still ongoing, showing the need for careful follow-up empirical work (Mertens et al., 2022b), and addressing publication bias through tools like Registered Reports.

Another demonstration of the confusing default effects literature is in regard to organ donations. Initial findings reported in Nudge (Thaler & Sunstein, 2009) based on Johnson et al. (2003) claimed a very strong effect of defaults on organ donation enrollment, with countries that have an opt-out organ donations showing remarkably higher organ donation enrollment compared to countries with opt-in. Later informal reports by Thaler (2021) showed the complete opposite findings when it comes to actual organ donations, reporting higher actual donations in countries with opt-in policies than countries with opt-out policies. The argument was that actual donations depend on the families that sign off on the organ donations, and families did not perceive automatic opt-out organ donation enrolment to be a real deliberate choice by loved ones thereby refusing to enact the donation, whereas voluntary opt-in seems as clearer indication of a conscious deliberate choice that families seem more willing to approve. In the recent version of the best selling book Nudge titled “Nudge The Final Edition” Thaler and Sustein (2021) return to the default effect discussion and argue for a misunderstanding of default effects and their stance in the original Nudge book, advocating for “prompted choice” rather than “presumed consent” and criticizing the implementation of default choice policies based on that misunderstanding by various regions in countries like England and Germany.

Recent high power pre-registered replications by Chandrashekar et al. (2023) of the CORE team (2023) also reported mixed support for defaults, with support for default effects in a replication of Johnson and Goldstein (2003), yet no support for default effects when contrasted against framing effects in a replication of Johnson, Bellman, and Lohse (2002). To these we also add the point we made above regarding the confusion between default and status-quo effects, in which status-quo effects are thought of as default effects, which may have resulted in overly optimistic expectations for stronger effects than the actual literature on actual default effects warrants.

Therefore, we conclude that despite defaults often being regarded as one of the most powerful nudge interventions, there is still much work to be done in this domain and to clarify the definition and scope of the effects, to empirically demonstrate their effectiveness and robustness across contexts, and to identify various moderating factors to ensure effective interventions with realistic expectations.

Given the conceptual confusion of status quo bias and default effect in the target article, and given the mixed findings in the literature, we aimed to investigate the default effects together with status quo bias.

## Pre-registration and open-science

We provided all materials, data, and code on: <https://osf.io/n9zp4/>.
This project received Peer Community in Registered Report Stage 1 in-principle acceptance ((ENTER LINK AFTER IPA); (ENTER LINK AFTER IPA)) after which we created a frozen pre-registration version of the entire Stage 1 packet (ENTER LINK AFTER IPA) and proceeded to data collection. All measures, manipulations, exclusions conducted for this investigation are reported, and data collection was completed before analyses.

# Method

[IMPORTANT:
Method and results were written using a randomized dataset produced by Qualtrics to simulate what these sections will look like after data collection. These will be updated following the data collection. For the purpose of the simulation, we wrote these sections in past tense, but no pre-registration or data collection took place yet.]

## Power and sensitivity analyses

We calculated effect sizes (ES) and power based on the statistics reported in the target article through G\*Power (Faul et al., 2007). The effects were Cohen’s omega= 0.25 in Experiment 1 and Cohen’s omega = 0.24 in Experiment 2, and our power analysis indicated that the smallest required sample size was 236 for a power of 0.95 and alpha of 0.05. We included the details of the calculation and power analysis in the “Effect size calculations of the original study effects” section in the supplementary materials.

Given the many adjustments we added to the replication, adding a condition to the status quo manipulation, and adding an additional independent variable (resulting in a 3 by 3 between subject design), and taking into account possible exclusions, we aimed for a total sample of 1500 participants. A sensitivity analysis of ANOVA *f*-test (alpha = .05, power = .95) indicated that a sample of 1350 (assuming 10% exclusions) would allow the detection of *f* = 0.12 (interaction for: groups = 9, numerator df = 4) and w = 0.12, which are effects much weaker than any effects reported in the target article. Also, the sample would be sufficiently powered to detect contrasts of *d* = 0.42 (*n* per condition after 10% assumed exclusions = 150; 95% power, alpha = 5%, two-tail), which correspond to slightly above medium effects in social psychology research (Xiao et al., 2023).

[To demonstrate the results after data collection we simulated a dataset of 1001 participants using Qualtrics and reported our analyses below based on that dataset. Results will later be updated to a sample of 1500 and the real data.]

## Participants

We recruited 1500 US American participants online on Amazon Mechanical Turk (MTurk) using CloudResearch/TurkPrime (Litman et al., 2017) (*Mage* = 48.81 *SD* = 28.84). We summarized a comparison of the target article sample and the replication sample in Table 3.

The final sample included 1500 participants (.... females, … males) aged from 18 to….[summary of the demographic information of participants, including age, gender, the state/province and income level.]

Based on our extensive experience of running similar judgment and decision making replications on MTurk, to ensure high quality data collection, we employed the following CloudResearch options: Duplicate IP Block. Duplicate Geocode Block, Suspicious Geocode Block, Verify Worker Country Location, Enhanced Privacy, CloudResearch Approved Participants and Block Low Quality Participants. We employed the Qualtrics fraud and spam prevention measures: reCAPTCHA, prevent multiple submissions, prevent ballotstuffing, bot detection, security scan monitor, and relevantID.

[The assignment pay is based on the federal wage of 7.25USD/hour, per minute, so for example 5-8 minutes survey would be paid 1 USD per participant. We first pretested survey duration with 30 participants to make sure our time run estimate was accurate and adjusted pay as needed, the data of the 30 participants was not analyzed other than to assess survey completion duration and needed pay adjustments. For those pretest participants, if survey duration was longer than expected, they were paid a bonus as pay adjustment. The pretest participants' responses were included in the final analysis.]

Table 3

*Differences and similarities between original study and replication*

|  |  |  |
| --- | --- | --- |
|  | Dinner et al. (2011) | US MTurk workers |
| Sample size | Study 1: 209Study 2: 126 | X |
| Geographic origin | Adults 1 | US American adults |
| Gender  | Study 1:68% femalesStudy 2 66% females | X males, X females, X other/did not disclose |
| Median age (years) | Unreported | 49 |
| Average age (years) | Study 1: 35Study 2: 34  | 50.28 |
| Standard deviation age (years) | Unreported | 29.41 |
| Age range (years) | 18-65 | 0-100 |
| Medium (location) | University national online panel | Computer (online) |
| Compensation | Unreported | Nominal payment |
| Year  | 2011 or earlier | 2023 |

## *Note*. 1 Origin was not explicitly mentioned in the target article.

Table 4

*Replication and extension experimental design*

|  |  |  |  |
| --- | --- | --- | --- |
| IV1: Status quo (between-subjects)**Extensions**IV2: Default options (between-subjects) | **IV1: LED-status quo condition**LED bulbs as preset in the household scenario.  | **IV1: CFL-status quo condition**CFL bulbs as preset in the household scenario.  | **IV1: No-status quo condition (Control)**No light bulbs are set in the household scenario.  |
| **IV2: LED-Default Condition**LED bulbs are presented as the default option. |  | DV1: Light bulb choice (Replication)“In this situation, what will you do?” “I will tell the contractor to…”(Forced choice item: *LED bulbs* / *CFL bulbs*)(The framing of the choice differed among the status quo conditions, varying:“leave the LED/CFL” / “switch to LED/CFL” “light bulbs”DV2: Light bulb preference (Extension)“Please indicate your general preference as to which light bulb you would like your remodeled house to have at the end:”(-100 = strong *preference for Light Emitting Diode Bulb* (LED); 100 = strong *preference for Compact Fluorescent Bulbs* (CFL); 0 = *neutral no preference*) DV3: Direct implied endorsement “I made my choice because the contractor appeared to want me to select that option.”(1 = *Strongly disagree* to 7 = *Strongly agree*) DV4: External implied endorsement“I made my choice because I thought about what most people would do.”(1 = *Strongly disagree* to 7 = *Strongly agree*) DV5: Perceived Effort“I made my choice because it was easier to choose that option.”(1 = *Strongly disagree* to 7 = *Strongly agree*) |
|  |  |  |
| **IV2: CFL-Default Condition**CFL bulbs are presented as the default option. |  |
|  |
| **IV2: No default (control)**No default set. |  |
|  |

##

We summarized the 3x3 between-subject experimental design in Table 4: 3 status quo conditions (replication: Compact Fluorescent bulbs [CFL] versus Light Emitting Diode bulbs [LED] versus control with no status quo) by 3 default conditions (extension: CFL versus LED versus control with no defaults). We randomized the display of conditions (“evenly presented” in Qualtrics).

## Procedure

[*For review: The Qualtrics survey .QSF file and an exported DOCX file are provided on the OSF folder. A preview link of the Qualtrics survey is provided on:* <https://hku.au1.qualtrics.com/jfe/preview/previewId/27899a48-ba75-4ee0-af66-5a2d3970d017/SV_bPBZkp8knWeyfQi?Q_CHL=preview&Q_SurveyVersionID=current> ]

Participants completed the survey via the online survey system Qualtrics. Participants indicated their consent, with four questions confirming their eligibility, understanding, and agreement with study terms, which they must answer with a “yes” and required responses in order to proceed to the study. Three of the four questions also served as attention checks, with the options order being rotated (yes, no, not sure). Participants were then randomly assigned to one of the 9 conditions (3x3 between subject design). The scenario and choice defaults varied between conditions, with the dependent variables being the same across conditions.

In their assigned conditions, participants first read a scenario, and answered comprehension questions ensuring their comprehension of the status quo manipulations in their assigned scenario. Participants had to answer these questions correctly before proceeding, and if they answered incorrectly, they would get a message asking them to re-examine their responses, and they can try and answer those multiple times until getting the correct answers. This was not meant to exclude inattentive participants, but rather to alert participants to a possible misunderstanding, and to communicate to participants we were serious about them reading the scenario carefully and their correct comprehension of the scenario. We note that status quo comprehension checks are a deviation from the target’s original methods, which we felt are important to ensure that our participants indeed read, understood, and processed the crucial information.

In the following page, participants were shown a reminder of the scenario, and then indicated their choice between LED and CFL bulbs (replication) and their preference of light bulb (extension). Defaults were manipulated through pre-selecting the default option in the dichotomous choice set and also setting a pre-selection on the slider, aligned with the pre-selected choice of default, in the preference question. (see Figure 1a)

Figure 1a

*Example of the question presented under a default choice manipulation (CFL-Default condition).* 

Below the choice and preference questions, we added an extension comprehension clarification to help ensure that participants understood the dichotomous options correctly. We felt that this was important given that in the target article the choices between “to leave the Incandescent bulbs” and “to switch to Compact Fluorescent Bulbs” might be misunderstood, given that the word “leave” has several meanings, and that “switch to” did not seem to fully describe the status quo, and the act of removing the current bulbs and installing new bulbs instead.

Participants then rated their agreement to the dependent measure statements examining perceived effort and endorsement, and answered several exploratory questions checking whether they noticed the defaults, their interpretation of defaults, and questions regarding their knowledge of the recent regulation change of light bulb in the United States and their state of residence.

 Finally, participants answered funneling questions, provided demographic information, and were debriefed.

## Manipulations

### Replication: Status quo: CFL-status quo vs. LED-status quo

 In the target article, the scenario adopted two types of light bulb for comparison, which were the Incandescent light bulbs (INC) and Compact fluorescent light bulbs (CFL) for the status quo manipulation and the default options. We replaced the use of INC with Light Emitting Diode bulbs (LED) as multiple regulations across the globe phased out the use of INC bulbs in the past decade. We updated the light bulb comparison tables using similar principles to that of the target article’s, with CFL reflecting lower purchasing costs but higher electricity costs, whereas LED reflected higher purchasing costs but low electricity costs.

In the LED-status quo condition, participants read that “the new fixtures have been outfitted with Light Emitting Diode (LED) light bulbs”. In the CFL-status quo condition, participants read that “the new fixtures have been outfitted with Compact Fluorescent (CFL) light bulbs”. The manipulated information was bolded and underlined across the versions of scenario texts and reminder texts. We included a visual example of the status quo manipulation in Figure 1b and all details in the supplementary materials under “Materials and scales used in the replication + extension experiment”.

Figure 1b

*LED-status quo condition: Sample screenshot*



### Extension

#### IV(1): Status quo (Control with no status quo)

We added a control condition in which participants read that the contractor has not yet installed any light bulbs for the newly installed light fixtures, presenting participants with a choice between CFL and LED bulbs.

#### IV(2): Defaults (LED-default vs. CFL-default vs. Control with no default)

We added a manipulation of defaults by modifying the pre-selected option in the light bulb decision questions. In the LED-default condition, in the choice between the two bulbs the option of LED-light bulb was shown as selected, with the preference slider set to indicate clear preference for LED-bulbs (score of 100). In the CFL-default condition, the option of a CFL-light bulb decision was shown as selected, with the slider set to indicate clear preference for CFL-bulbs (score of -100). In the no-default control condition, none of the options have been pre-selected, and the slider was set to a position indicating a neutral preference (score of 0). We provided an example of the LED default in Figure 2, and the presentation of all conditions are provided in the supplementary materials and the Qualtrics export files in the OSF folder.

Figure 2

Default light bulb manipulation*: LED-default condition example*



*Note*. The selection circle with the blue dot indicates it is pre-selected, such that an inaction of not opting to change the selection will lead to a selection of the pre-selected default option as indicating the participant’s choice.

##

## Measures

### Replication

#### Choice of light bulbs

Participants in the LED-status quo or CFL-status quo conditions needed to choose between keeping (“leave the”) or switching (“switch to”) the two types of light bulbs: LED or CFL. Participants in the control-status quo condition chose which of the two types of light bulbs to install: LED or CFL.

#### Direct implied endorsement

Participants rated perceived direct implied endorsement: “I made my choice because the contractor appeared to want me to select that option.” (1 = *Strongly disagree*; 7 = *Strongly agree*).

#### Indirect implied endorsement

Participants rated perceived indirect implied endorsement: “I made my choice because I thought about what most people would do.” (1 = *Strongly disagree*; 7 = *Strongly agree*).

#### Perceived effort

Participants rated perceived effort: “I made my choice because it was easier to choose that option.”(1 = *Strongly disagree*; 7 = *Strongly agree*).

### Extensions

#### Preference (continuous)

We included an additional measure of light bulb preference using a continuous scale (-100 = preference for CFL-light bulbs; 0 = neutral, no preference; 100 = preference for LED-light bulbs).

#### Choice clarification question

In our replication, we used the dichotomous choice measure from the target article as is, yet were concerned that the participants misunderstood the two options. We sought to complement the target article’s methodology to verify that participants indeed understood the choice task in the intended way.

We therefore included an additional comprehension check question to ask participants regarding their understanding of the choice they made: “Which of the following best reflects your above choice? (Please make sure to read each option from beginning to end to ensure it captures both the context and your choice accurately.)”, with the following options:

My preference is to switch from the already pre-installed LED bulbs to CFL bulbs by **removing LED bulbs** and **installing CFL bulbs**.

My preference is to switch from the already pre-installed CFL bulbs to LED bulbs by **removing CFL bulbs** and **installing LED bulbs**.

My preference is to stay with the pre-installed CFL bulbs, meaning I **do not wish to switch** from the **pre-installed CFL bulbs** to LED bulbs.

My preference is to stay with the pre-installed LED bulbs, meaning I **do not wish to switch** from the **pre-installed LED** bulbs to CFL bulbs**.**

My preference is to choose LED bulbs for my light fixture, meaning that **no bulbs were pre-installed** by the contractor, and I indicated that I want the contractor to **install LED bulbs** from the two available light bulb options.

My preference is to choose CFL bulbs to the light fixture, meaning that **no bulbs were pre-installed** by the contractor, and I indicated that I want the contractor to **install CFL bulbs** from the two available light bulb options.

#### Comprehension checks for the status quo manipulation

To ensure that participants understood the information provided in the scenario, we incorporated comprehension question(s) to check participants’ understanding of the assigned status quo condition. Participants had to answer all the questions correctly before proceeding to the decision section. We note that this is a deviation from the target’s, which did not check or validate the participants’ attention to or understanding of the manipulation. We felt this was important to do given that the scenario had a lot of details, and the slight status quo manipulation could easily be overlooked if not read carefully.

The comprehension question for the status quo was: “To the best of your understanding, in the decision scenario… Which bulb has already been installed?”. The options for the comprehension question were the following: Light Emitting Diode (LED) light bulb; Compact fluorescent (CFL) light bulb; None; It does not say.

#### Exploratory directions: Feedback on defaults

The literature on defaults seems to make assumptions regarding if and how laypersons perceive and interpret defaults. We therefore added several exploratory measures to directly ask participants whether they noticed the defaults, and if they did - how they interpreted seeing the default in our survey. We put forward the prediction that participants do notice defaults and that they understand that not changing from the default would indicate to us experimenters (through the survey) that this is indeed their own choice, yet we are open to the possibility that this assumption is wrong and therefore flagged this as exploratory.

Finally, we added a question asking participants what they think are the most likely interpretations to a choice that is aligned with the default: “To the best of your understanding, when facing a decision between two options, if one of the options had been pre-selected, and someone proceeds to the next page without changing the pre-selected option, please rank the following according to likelihood (1 = highest likelihood):”, with the options:

They had a clear preference towards the pre-selected option, and there was no need to change.

They did not pay close attention to the question or the options, and just wanted to proceed to the next question.

They had no clear preference, and when they noticed the pre-selected option, they thought about it and realized that this is what they actually wanted.

They had no clear preference, and when they noticed the pre-selected option, they thought about it and decided to go along with it.

They had no clear preference, and when they noticed the pre-selected option they were too lazy to think about so just left it as is.

[Note to reviewers: This is based on our own understanding of defaults and a query we posted on Twitter, and we are very interested in feedback from the reviewers as to other possible interpretations of this behavior that we can ask the participants about. We are also interested in reviewer suggestions on any other exploratory questions that would help clarify laypersons interpretations of behavior regarding defaults. ]

#### Exploratory: Political orientation

In addition, in the last decade the light bulb choice has become a political issue with each of the presidents that has come to power reversing the previous administration’s decisions regarding phasing out old light bulbs and moving to newer greener light bulb technologies. To make things even more complicated, the US states differ in their implementation of the different federal policies. We therefore added two exploratory questions regarding political orientation, one categorical and one continuous between conservative and liberal, and an additional demographic question asking participants to indicate the state they are residing in.

## Deviations

We made several deviations from the target article’s design and methodology, and summarized those changes in Table 5.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
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|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|

## Evaluation criteria for replication findings

We aimed to compare the replication effects with the effects in the target article’s using the criteria set by LeBel et al. (2019) (see section “Replication evaluation” in the supplementary).

## Replication closeness evaluation

We provided details on the classification of the replications using the criteria by LeBel et al., (2018) criteria in Table 6 below (see section “replication closeness evaluation” in the supplementary). Though the baseline methods and the status quo manipulations were very similar, given all the adjustments, we summarized the replication as a “far” (conceptual) replication.

*Deviations:*

|  |  |  |  |
| --- | --- | --- | --- |
| Sample characteristics | *N1* = 190 / *N2* = 126National online panel | *N =* 1500US American MTurk participants on CloudResearch through Qualtrics | Accounting for one extra independent variable (3 levels) and exclusions. Increasing the generalizability of results by including a more diverse set of participants. |
| Procedure | No comprehension check | Comprehensionchecks after reading the assigned scenario | Ensuring participants read and understood the scenario |
|  | Scenario for making decision between INC and CFL bulbs | Updated Scenario text for making decision between LED and CFL bulbs | Recent regulation in the US aims to phase out the use of INC bulbs. Updating light bulb choices helps maintain the applicability of the scenario. |
|  | Self-coded aspect listing tasks  | Did not implement aspect listing tasks  | We did not implement tests of query theory and instead tested reference points by contrasting the replication’s status quo against the added independent variables of defaults. |
| Measurement | One item for the light bulb choice(dichotomous)  | Extended to 2 items - adding bulb preference (continuous scale). Added comprehension checks and clarification questions. | Trying to better assess the link between preferences and choice and how participants made their choices given the status quo and default manipulations.  |
| Statistical analysis | One-way ANOVAs, chi-square/linear & logistic regression | Logistic regression, ANOVAs, and chi-square for the light bulb choice and preference.Pearson’s correlations for associations between dependent variables. | Given the elaborate design with two independent factors, we changed to reporting the correlations between the dependent variables. |
| Conditions | 2 conditions (INC status quo vs. CFL status quo) | A total of 9 conditions in 3 (status quo: CFL vs LED vs Control) by 3 (default: CFL vs LED vs Control) | To examine the interaction between status quo bias and default effect.  |
|

Table 6

*Classification of the replication, based on LeBel et al. (2018)*

|  |  |  |
| --- | --- | --- |
| **Design facet** | **Replication** | **Details of deviation** |
| Effect/hypothesis | Similar/Different | We followed the target regarding status quo bias, yet added many additional elements contrasting with defaults.Our focus shifted from examining the mechanisms of status quo bias to testing choice given different reference points.  |
| IV construct | Similar | Replication: We shifted from the target’s use of “default” to “status quo bias” which we thought better captured what they measured.Extension: We added one IV. |
| DV construct | Similar | Replication: The same.Extension: We added several dependent measures. |
| IV operationalization | Similar | Replication: We shifted from the target’s use of “default” to “status quo bias” which we thought better captured what they measured.Extension: We added one IV. |
| DV operationalization | Similar  | Replication: The same.Extension: We added several dependent measures. |
| Population | Similar | Data collected on MTurk through CloudResearch, somewhat similar to the online panel described in the target article. |
| IV stimuli | Similar | Replication: We replaced the target’s pairwise comparison of Incandescent light bulb (INC) and Compact Fluorescent light bulbs (CFL) with the pairwise comparison of Compact Fluorescent light bulbs (CFL) and Light Emitting Diode light bulbs (LED) given to the regulation changes in EU and US about the use of light bulbs.  |
| DV stimuli | Same |  |
| Procedural details | Different | We did not implement the aspect listing tasks, and added several IVs and DVs on top of the replication. |
| Physical settings | Similar | Online. |
| Contextual variables | Similar/Different | Different time, similar uncontrolled context. |
| Replication classification | Far (conceptual) replication |  |

## Data analysis strategy

 We analyzed the two independent variables together and examined the status quo replication by examining the status quo contrasts (LED vs. CFL vs. Control) in the control conditions for the default manipulation.

We conducted several 3 (status quo: LED, CFL, Control; between) x 3 (default: LED, CFL, no default; between) tests. Two-way chi-square and logistic regression tests for the dichotomous measure and a two-way factorial ANOVA for the continuous preference scale, with Tukey HSD post-hoc comparisons.

We reported Pearson’s correlations for the associations between the dependent variables: Light bulb choice, light bulb preferences, direct implied endorsement, indirect implied endorsement, and perceived effort.

### Extension

#### Choice clarification question

We conducted a chi-square test contrasting the choice made in the replication dichotomous choice between the LED and CFL lightbulb with their choice in the clarification question.

### Outliers and exclusions

In the original study, the authors excluded participants that failed to follow the instructions, though the details were a bit vague. We instead implemented forced comprehension checks and validation, and we therefore do not classify outliers in the current replication, and aim to include all the data collected in our analysis. For exploratory exclusions in case we fail to find support for the hypotheses, see section “Exclusion criteria” in the supplementary materials.

### Nonparametric tests

In case we fail to find support for our replication hypotheses regarding status quo effects, we will conduct an additional set of analyses examining normality and the need for running exploratory non-parametric tests. We reserve this for case of failure, given that our main aim is to follow the target and the target did not implement such analyses. In such a case we will report both tests side by side with the non-parametric tests clearly marked as exploratory, and to address issues of multiple testing we will use a stricter lower target alpha for the non-parametric tests set to .005.

#

# Results

[IMPORTANT:
Method and results were written using a randomized dataset produced by Qualtrics to simulate what these sections will look like after data collection. These will be updated following the data collection. For the purpose of the simulation, we wrote these sections in past tense, but no pre-registration or data collection took place yet.]

[Planned analyses are provided in the JAMOVI file made available on the OSF folder. The following is provided as an initial outline, and we will expand and update this section accordingly.]

## Replication

 We conducted the analyses on Qualtrics simulated data with JAMOVI (Version: 2.2.5), and made data analysis files and outputs available on the OSF.

We summarized descriptive statistics in Tables 7a-7e. We summarized the statistics for the status quo bias in Table 9 with plots in Figure 3a and Figure 3b. We summarized correlations between the dependent variables in Table 10.

**Table 7a**

*Light bulb choice (Dichotomous) (replication): Descriptives*

|  |  |  |  |
| --- | --- | --- | --- |
| Conditions |  | IV2: Default conditions (extension) | Overall |
| IV1: status quo Conditions |  | CFL-Default | LED-Default | ControlCondition |
| CFL-status quo |  | 0.48 [0.50] (167) | 0.47 [0.50] (167) | 0.46 [0.50] (166) | 0.48 [0.50] (251) |
| LED-status quo |  | 0.47 [0.55] (167) | 0.50 [0.50] (167) | 0.48 [0.50] (167) | 0.47 [0.50] (500) |
|  |  | 0.49 [0.50] (167) | 0.57 [0.50] (166) | 0.47 [0.50] (166) | 0.51 [0.50] (499) |
|  |  |  |  |  |  |
| Overall |  | 0.48 [0.50] (501) | 0.51 [0.50] (500) | 0.47 [0.50] (499) | 0.49 [0.50] (1500) |

*Note*. Format: Mean [standard deviation] (sample size). CFL = Fluorescent, LED = Light Emitting Diode. Choice between 0 (CFL) and 1 (LED).

**Table 7b**

*Light bulb preference (Continuous) (extension): Descriptives*

|  |  |  |  |
| --- | --- | --- | --- |
| Conditions |  | IV2: Default conditions (extension) | Overall |
| IV1: status quo Conditions |  | CFL-Default | LED-Default | ControlCondition |
| CFL-status quo |  |  | 12.32 [57.18] (167) | 0.10 [59.23] (167) | -1.12 [59.23] (166) | 3.78 [58.89] (500) |
| LED-status quo | -4.91 [58.63] (167) | -4.52[57.73] (167) | 9.85 [58.37] (167) | 0.14 [58.53] (501) |
|  | Control Condition |  | 4.92 [56.83] (167) | 0.89 [54.67] (166) | -4.46 [56.83] (166) | 3.33 [57.13] (499) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Overall |  | 4.11 [58.94] (501) | -1.18 [57.18] (500) | 4.31 [58.35] (499) | 2.41 [58.17] (1500) |

*Note*. Format: Mean [standard deviation] (sample size). CFL = Fluorescent, LED = Light Emitting Diode. Scale is from -100 (preference for CFL) to 100 (preference for LED)

**Table 7c**

*Direct implied endorsement (replication): Descriptives*

|  |  |  |  |
| --- | --- | --- | --- |
| Conditions |  | IV2: Default conditions (extension) | Overall |
| IV1: status quo Conditions |  | CFL-Default | LED-Default | ControlCondition |
| CFL-status quo |  | 3.86 [2.01] (167) | 4.04 [2.02] (167) | 3.80 [2.12] (166) | 3.90 [2.05] (500) |
| LED-status quo |  |  |  | 3.95 [2.05] (167) | 4.17 [1.95] (167) | 4.11[1.86] (167) | 3.90 [2.05] (501) |
|  |  |  |  |  |  |
|  | Control Condition | 4.27 [1.91] (167) | 4.10 [1.96](166) | 3.84 [1.89] (166) | 4.07 [1.92] (499) |
| Overall |  | 4.01 [2.03] (501) | 4.01 [2.03] (500) | 3.93 [1.92] (499) | 4.02 [1.98] (1500) |

*Note*. Format: Mean [standard deviation] (sample size). CFL = Fluorescent, LED = Light Emitting Diode. Scale for “I made my choice because the contractor appeared to want me to select that option.” on a scale of 1 (*Strongly disagree*) to 7 (*Strongly agree*).

**Table 7d**

*Indirect implied endorsement (replication): Descriptives*

|  |  |  |  |
| --- | --- | --- | --- |
| Conditions |  | IV2: Default conditions (extension) | Overall |
| IV1: status quo Conditions |  | CFL-Default | LED-Default | ControlCondition |
| CFL-status quo |  | 4.16 [1.81] (167) |  | 3.98 [1.87] (167) | 3.78 [1.92] (166) | 3.98 [2.01] (500) |
|  |  |  |  |  |  |
| LED-status quo |  | 4.09 [21.95] (167) | 3.96 [1.98] (167) | 4.07 [1.96] (167) | 4.072 [0.45] (501) |
|  | Control Condition | 4.00 [2.05] (167) | 3.98 [1.95] (166) | 4.01[2.03] (166) | 4.00 [2.01 ] (499) |  |
| Overall |  | 3.97 [1.94] (501) | 3.95 [1.94] (500) | 3.95 [1.98] (499) | 4.00 [1.95] (1500) |

*Note*. Format: Mean [standard deviation] (sample size). CFL = Fluorescent, LED = Light Emitting Diode. Scale for “I made my choice because I thought about what most people would do.” on a scale of 1 (*Strongly disagree*) to 7 (*Strongly agree*).

**Table 7e**

*Perceived Effort (replication): Descriptives*

|  |  |  |  |
| --- | --- | --- | --- |
| Conditions |  | IV2: Default conditions (extension) | Overall |
| IV1: status quo Conditions |  | CFL-Default | LED-Default | ControlCondition |
| CFL-status quo | 4.19 [2.02] (167) | 3.84 [1.98] (167) | 4.01[2.01] (166) | 4.01[2.01] (500) |  |  |
| LED-status quo | 3.86[1.99] (167) | 4.19[2.03] (167) |  | 3.91 [2.12] (167) | 3.99 [2.05] (501) |
|  |  |  |  |  |  |
|  | Control Condition | 3.92 [2.08] (167) | 3.94 [2.01] (166) |  | 4.12 [2.04] (166) | 3.99 [2.04] (499) |
| Overall |  | 4.01 [2.05] (501) | 3.99 [2.01] (500) | 4.01 [2.05] (499) | 4.00 [2.03] (1500) |

*Note*. Format: Mean [standard deviation] (sample size). CFL = Fluorescent, LED = Light Emitting Diode. Scale for “I made my choice because it was easier to choose that option.” on a scale of 1 (*Strongly disagree*) to 7 (*Strongly agree*).

**

*Figure 3a*. Two-way interaction plot between status quo and default on light bulb choice: 0 = CFL, 1 = LED. Created using JAMOVI.



*Figure 3b.* Two-way interaction plot between status quo and default on light bulb preference. The scale is from -100 = preference for CFL, 100 = preference for LED. Created using JAMOVI.

|  |
| --- |
| Table 8 *Status quo comprehension check: Contingency Table and χ² test*  |
| **Comprehension check answer** |
| **Status quo Condition** | **CFLstatus quo****Switch** | **LEDstatus quo****Switch** | **CFLstatus quo****No****switch** | **LEDstatus quo****No Switch** | **Control status quo LED preference** | **Control status quo** **CFL preference** | **Total(n)** |
| CFL status quoSwitch | 44 | 43 | 41 | 35 | 34 | 39 | 236 |
| LED status quoSwitch | 47 | 50 | 40 | 33 | 43 | 45 | 258 |
| CFL status quoNo switch | 41 | 44 | 36 | 50 | 49 | 44 | 264 |  |
| LED status quoNo Switch | 24 | 40 | 44 | 39 | 44 | 52 | 243 |
| Control status quo LED preference | 43 | 47 | 41 | 43 | 44 | 38 | 256 |
| Control status quo CFL preference | 37 | 41 | 49 | 33 | 47 | 36 | 243 |
| Total (n) | 236 | 265 | 251 | 233 | 261 | 254 | 1500 |

Table 9

*Status quo bias replication and extension: Summary of statistical tests for*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variables  | Tests | ***χ2*** | df | *p* | Original Effect size (Exp.2) | Original 95% CI(Exp.2) | Interpretation |
| Choice (dichotomous) | Logistic regression | 0.25 | 2 | .88 | Exp1: 12.3(*p*=<.01)Exp2: 6.98(*p*=<.01) | CIL:1.802CIH:12.158 | No-signal/inconsistent |
| IV: Status quoDV: Clarification question | Chi-square test (extension) | 23.19 | 25 | .566 | N/A | N/A | (Extension) |
| DV item | Tests | *M* | df | *p* | *d* | CIL | CIH | Interpretation |
| IV: Status quoDV: Preference (continuous)(extension) | Factorial ANOVA post-hoc | -3.63 | 1491 | .584 | -.063 | -.186 | .062 | (Extension) |

*Note*. Independent variable is status-quo. CI = 95% confidence intervals, CIL= Lower Confidence Interval, CIH= Higher Confidence Interval. The interpretation of outcome is based on LeBel et al. (2019).

### Status quo bias impact on choice

We conducted a series of tests to determine whether status quo had any impact on the summarized tests in Table 9.

We first contrasted the status quo CFL vs. LED in the default control condition…

We then examined the main effect of the status quo across all conditions (extension analysis)...

[Table 9 is provided as an initial example. We will summarize tests in Table 9 and will complement the table stats with text description]

### Perceived direct/indirect endorsement and effort underlying status quo (replication)

We summarized Pearson’s correlations between the dependent variables in Table 10.

We found no support for hypothesis (no.) in light bulbs choice is associated with direct implied endorsement (*r*(1498) = .015, 95% CI [-.03, .06], *p* = .561), indirect implied endorsement (*r*(1498) = .027, 95% CI [-.03, .06], *p* = .28), and perceived effort ( *r*(1498) = -.005, 95% CI [-.05, .04], *p* = .845).

We found no support for the hypothesis that the light bulb preference is associated with direct implied endorsement (*r*(1498) = -.024, 95% CI[-.07, .026], *p* = .341), indirect implied endorsement (*r*(91498) = -.015, 95% CI [-.06, .03], *p* = .549), and ease of decision (*r*(1498) = .066, 95% CI [.01, .11], *p* = .01).

Table 10

*Replication: Pearson's Correlation Matrix Decision of light bulbs VS Theoretical Causes of Status quo bias*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 |
| 1 - Light bulb Choice | 0.49 | 0.50 | — |   |   |   |   |
| 2 - Light bulbs Preference | 2.41 | 58.18 | -.011[-.06, .03](.656) | — |   |   |   |
| 3 - Direct Implied Endorsement | 4.02 | 1.98 | .015[-.03, .06](.561) | -.024[-.07, .026](.341) | — |   |   |
| 4 - Indirect Implied Endorsement | 4.00 | 1.95 | .027[-.03, .06](.28) | -.015[-.06, .03](.549) | -.001[-.05, .04](.96) | — |   |
| 5 - Perceived Effort | 4.00 | 2.03 | -.005[-.05, .04](.845) | .066[.01, .11](.01) | .030[-.02, .08](.24) | -.016[-.06 .03](.53) | — |

*Note*. Pearson’s correlations (*N* = 1001). Format: Correlations (p-value) [confidence interval].All values are rounded to the nearest 2 decimal points.

###

## Extensions

### Status quo manipulation comprehension check

We conducted a chi-square test for the outcome measure of the comprehension question and the status quo condition manipulation. We found that ….

### Light bulb preference: status quo and default

We conducted a two-way factorial ANOVA on light bulb preference continuous measure. We found … [summary of main effects followed by interactions, and for interactions of interest Tukey post-hoc comparisons]

### Perceived direct/indirect endorsement and effort: status quo and default

We conducted a two-way factorial ANOVA on perceived direct/indirect endorsement and effort. We found … [summary of main effects followed by interactions, and for interactions of interest Tukey post-hoc comparisons]

## Exploratory analyses

We will update this section in Stage 2.

## Comparing replication to original findings

We will interpret the outcomes based on LeBel et al. (2019) replication success evaluation criteria following data collection in Stage 2.

# Discussion

[Please note that the discussion is only to be completed in Stage 2 following data collection]

We conducted a pre-registered replication of status quo bias. The results are [consistent/not consistent/partially consistent and partially inconsistent] with the original results (see Table X for a summary of the replication).

## Replication

Overall, we found that: (1) [...] , (2) [...] , (3) [...], and (4) [...]

In summary, the goal of the project was to assess the replicability of the research presented by Dinner et al. (2011) in support of status quo bias.

## Replication adjustment

### Regulation policy changes in Europe and the US

Our replication presented us with a unique challenge. We originally intended to replicate Dinner et al.(2011)’s studies as is, in which the experimental manipulation of status quo was implemented using comparison between two types of the pre-installed light bulbs: INC bulbs versus CFL bulbs. That experimental design was well suited for that specific point in time as they were transitioning from INC bulbs towards more environment energy-efficient CFL bulbs. During our peer review process, we were alerted by reviewer Dr./Prof. Laurens van Gestel to the possibility that the regulation situation has changed. Investigating the point further has led us to realize that the situation has shifted dramatically in the US, and thanks to that comment, we have decided to shift from contrasting INC and CFL light bulbs to contrasting CFL and LED light bulbs.

We found that …….

[Planned discussion of the implication of the adjustment and the dilemma between keeping old materials versus having to update those to different context. ]

## Extensions

We ran extensions examining .... Overall, our findings showed that ... We found [weak to no / weak / medium / strong] support for our hypothesis.

### Preference and its impact to status quo bias

We ran extensions examining .... Overall, our findings showed that ... We found [weak to no / weak / medium / strong] support for our hypothesis.

## Implications, limitations, and directions for future research

### Importance of Registered Reports and peer review over pre-registration plan

[Planned discussion: We benefited greatly from peer review over our Stage 1 initial plan where reviewers suggest invaluable improvements which helped us avoid important oversights and overall improve our design and chances of success. We’ll briefly discuss that.]

### Importance of adapting replication materials to changing context

[Planned discussion: Thanks to Reviewer Dr./Prof. Laurens van Gestel we caught an important oversight regarding the changing energy regulation landscape in the US which has led to an important change in our revision. We will use this opportunity to discuss the need to carefully consider the replication relevance to context.]

### Habits, past behavior and reference point

[Planned discussion: Examining reference points and past behavior, an IV that was included in the original submission but was removed thanks to feedback from peer review. In the context of reference points and past behavior we will also briefly discuss habit formation, also suggested by Dr./Prof. Laurens van Gestel in the peer review process.]

### Preferences, Traits, and Nudgeability

[Planned discussion: We will briefly discuss stable preferences, traits, and Nudgeability as potential directions for future research with references to work such as that by de Ridder and Venema, suggested by Dr./Prof. Laurens van Gestel during peer review.]

### Changing regulations and implications for replications

The European Union and the United States announced new regulations to phase out the use of incandescent light bulbs in favor of more energy-efficient alternatives throughout the past decade. These measures and regulations aimed to reduce greenhouse gas emission and promote energy efficiency by phasing out the use of old energy-inefficient light bulb technology. Starting from 2009, Members of EU agreed on phasing out the use of incandescent bulbs by 2012 (European Union, 2008). Similar laws were promoted in the US starting from 2007 to phase out incandescent light bulbs gradually.(Kiger, 2013). Although some incandescent bulbs are still available on the market, their use is still mostly limited for industrial or special purposes use, while the use of INC light bulbs is no longer recommended for general household usage. Following the phasing out of incandescent bulbs, recent regulations in EU and US also phase out the use of halogen bulbs (i.e., Compact fluorescent light bulbs). The current plan is for the United States to require all light bulbs to meet a minimum efficiency standard of 45 lumens per watt by January 2025 (U.S. Department of Energy, 2022), as the EU Commission also plans to ban the sales of CFL light bulbs from September, 2023. (European Council for an Energy Efficient economy, 2021)

[Planned discussion about implications of regulation change and the limitations in adapting old materials to new situations.]

### Adjustments to the target article: Comprehension checks

[Planned discussion about limitations and implications of making adjustments to the original design such as adding comprehension checks, balancing the need to ensure attentiveness and comprehension with making things explicit with the risk of demand effects]

### Query theory and additional factors underlying status quo and default effects

[Planned discussion: In our replication we chose not to examine query theory from the target article. Our main aim for this project was to first establish the phenomena. In this section, based on our findings, we will discuss future directions for follow-up research to test query theory and other possible explanations and mechanisms for the two effects. We will also briefly discuss the challenges in replicating the Query theory effects reported in the target article.]

# Conclusion

# References

Acquisti, A., Adjerid, I., Balebako, R. H., Brandimarte, L., Cranor, L. F., Komanduri, S., Leon, P. G., Sadeh, N., Schaub, F., Sleeper, M., Wang, Y., & Wilson, S. (2016). Nudges for privacy and security: Understanding and assisting userss choices online. *SSRN Electronic Journal*, 50(3), 1–41. DOI: [10.2139/ssrn.2859227](https://doi.org/10.2139/ssrn.2859227)

Baron, J., & Ritov, I. (2009). Protected values and omission bias as deontological judgments. *Psychology of learning and motivation*, 50, 133-167. https://doi.org/10.1016/S0079-7421(08)00404-0

Briscese, G. (2019). Generous by default: A field experiment on designing defaults that align with past behavior on charitable giving. *Journal of Economic Psychology*, 74, 102187. DOI: [10.1016/j.joep.2019.06.010](https://doi.org/10.1016/j.joep.2019.06.010)

Chandrashekar, S. P., Adelina, N., Zeng, S., Chiu, Y. Y. E., Leung, Y., Henne, P., ... & Feldman, G. (2023). Defaults versus framing: Revisiting Default Effect and Framing Effect with replications and extensions of Johnson and Goldstein (2003) and Johnson, Bellman, and Lohse (2002). *Meta Psychology*.

CORE Team (2023). Collaborative Open-science and meta REsearch. DOI 10.17605/OSF.IO/5Z4A8. Retrieved from<http://osf.io/5z4a8> and<https://mgto.org/core-team/>

Dinner, I., Johnson, E. J., Goldstein, D. G., & Liu, K. (2011). Partitioning default effects: Why people choose not to choose. *Journal of Experimental Psychology: Applied,* 17(4), 332–341. DOI: [10.1037/a0024354](https://doi.org/10.1037/a0024354)

Eidelman, S., & Crandall, C. S. (2012). Bias in favor of the status quo. *Social and Personality Psychology Compass*, 6(3), 270-281. https://doi.org/10.1111/j.1751-9004.2012.00427.x

European Council for an Energy Efficient economy. (2021, December 17). EU Commission adopts regulation to ban all fluorescent lighting by September 2023. https://www.eceee.org/all-news/news/eu-commission-adopts-regulation-to-ban-fluorescent-lighting-by-september-2023/

European Union. (2008, December 8). Member States approve the phasing-out of incandescent bulbs by 2012. https://ec.europa.eu/commission/presscorner/detail/en/IP\_08\_1909

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. DOI: [10.3758/BF03193146](https://doi.org/10.3758/BF03193146)

Feldman, G. (2020). What is normal? Dimensions of action-inaction normality and their impact on regret in the action-effect. *Cognition and Emotion*, 34, 728–742. <https://doi.org/10.1080/02699931.2019.1675598>

Feldman, G., & Albarracín, D. (2017). Norm theory and the action-effect: The role of social norms in regret following action and inaction. *Journal of Experimental Social Psychology*, *69*, 111-120. <https://doi.org/10.1016/j.jesp.2016.07.009>

Feldman, G., Kutscher, L., & Yay, T. (2020). Omission and commission in judgment and decision making: Understanding and linking action‐inaction effects using the concept of normality. *Social and Personality Psychology Compass*, *14*(8), e12557. <https://doi.org/10.1111/spc3.12557>

Fowlie, M., Wolfram, C., Baylis, P., Spurlock, C. A., Todd-Blick, A., & Cappers, P. (2021). Default effects and follow-on behavior: Evidence from an electricity pricing program. *The Review of Economic Studies*, 88(6), 2886–2934. DOI: [10.1093/restud/rdab018](https://doi.org/10.1093/restud/rdab018)

Halpern, S. D., Loewenstein, G., Volpp, K. G., Cooney, E., Vranas, K., Quill, C. M., McKenzie, M. S., Harhay, M. O., Gabler, N. B., Silva, T., Arnold, R., Angus, D. C., & Bryce, C. (2013). Default options in advance directives influence how patients set goals for end-of-life care. *Health Affairs*, 32(2), 408–417. https://doi.org/10.1377/hlthaff.2012.0895

Johnson, E. J., Bellman, S., & Lohse, G. L. (2002). Defaults, framing and privacy: Why opting in-opting out. *Marketing letters*, *13*, 5-15.

Johnson, E. J., & Goldstein, D. (2003). Do defaults save lives? *Science*, 302(5649), 1338–1339. DOI: [10.1126/science.1091721](https://doi.org/10.1126/science.1091721)

Johnson, E. J., Hassin, R., Baker, T., Bajger, A. T., & Treuer, G. (2013). Can consumers make affordable care affordable? the value of choice architecture. *PLoS ONE*, 8(12). DOI: [10.1371/journal.pone.0081521](https://doi.org/10.1371/journal.pone.0081521)

Johnson, E. J., Shu, S. B., Dellaert, B. G., Fox, C., Goldstein, D. G., Häubl, G., Larrick, R. P., Payne, J. W., Peters, E., Schkade, D., Wansink, B., & Weber, E. U. (2012). Beyond nudges: Tools of a choice architecture. *Marketing Letters*, 23(2), 487–504. DOI: [10.1007/s11002-012-9186-1](https://doi.org/10.1007/s11002-012-9186-1)

Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *Journal of Economic Perspectives*, 5(1), 193–206. DOI: [10.1257/jep.5.1.193](https://doi.org/10.1257/jep.5.1.193)

Kiger, P(2013, December 31). *U.S. phase-out of incandescent light bulbs continues in 2014 with 40-, 60-watt varieties*. Environment. https://www.nationalgeographic.com/environment/article/u-s-phase-out-of-incandescent-light-bulbs-continues-in-2014-with-40-60-watt-varieties

LeBel, E. P., McCarthy, R. J., Earp, B. D., Elson, M., & Vanpaemel, W. (2018). A unified framework to quantify the credibility of scientific findings. *Advances in Methods and Practices in Psychological Science*, *1*, 389-402. DOI: [10.1177/2515245918787489](https://doi.org/10.1177/2515245918787489)

LeBel, E. P., Vanpaemel, W., Cheung, I., & Campbell, L. (2019). A brief guide to evaluate replications. *Meta-Psychology*, 3, 1-9. DOI: [10.15626/MP.2018.843](https://doi.org/10.15626/MP.2018.843)

Maier, M., Bartoš, F., Stanley, T. D., Shanks, D. R., Harris, A. J., & Wagenmakers, E. J. (2022). No evidence for nudging after adjusting for publication bias. *Proceedings of the National Academy of Sciences*, *119*(31), e2200300119.

McKenzie, C. R. M., Liersch, M. J., & Finkelstein, S. R. (2006). Recommendations implicit in policy defaults. *Psychological Science,* 17(5), 414–420. DOI: [10.1111/j.1467-9280.2006.01721.x](https://doi.org/10.1111/j.1467-9280.2006.01721.x)

Mertens, S., Herberz, M., Hahnel, U. J. J., & Brosch, T. (2022a). The effectiveness of nudging: A meta-analysis of choice architecture interventions across behavioral domains. *Proceedings of the National Academy of Sciences*, 119(1), e2107346118. doi: 10.1073/pnas.2107346118

Mertens, S., Herberz, M., Hahnel, U. J., & Brosch, T. (2022b). Reply to Maier et al., Szaszi et al., and Bakdash and Marusich: The present and future of choice architecture research. *Proceedings of the National Academy of Sciences*, *119*(31), e2202928119.

Nosek, B. A., & Errington, T. M. (2020). What is replication?. *PLOS Biology*, 18(3), e3000691. <https://doi.org/10.1371/journal.pbio.3000691>

Nosek, B. A., Hardwicke, T. E., Moshontz, H., Allard, A., Corker, K. S., Dreber, A., ... & Vazire, S. (2022). Replicability, robustness, and reproducibility in psychological science. *Annual Review of Psychology*, 73(1), 719-748. DOI: [10.1371/journal.pbio.3000691](https://doi.org/10.1371/journal.pbio.3000691)

Samuelson, W., & Zeckhauser, R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty*, 1(1), 7–59. DOI: [10.1007/bf00055564](https://doi.org/10.1007/bf00055564)

Shevchenko, Y., von Helversen, B., & Scheibehenne, B. (2014). Change and status quo indecisions with defaults: The effect of incidental emotions depends on the type of default. *Judgment and Decision making*, 9, 287.

Spälti, A. K., Brandt, M. J., & Zeelenberg, M. (2017). Memory retrieval processes help explain the incumbency advantage. *Judgment and Decision Making*, 12(2), 173–182. DOI: [10.1017/s1930297500005714](https://doi.org/10.1017/s1930297500005714)

Smiley, A. H., & Fisher, M. (2022). The golden age is behind us: How the status quo impacts the evaluation of Technology. *Psychological Science*, 33(9), 1605–1614. https://doi.org/10.1177/09567976221102868

Szaszi, B., Higney, A., Charlton, A., Gelman, A., Ziano, I., Aczel, B., ... & Tipton, E. (2022). No reason to expect large and consistent effects of nudge interventions. *Proceedings of the National Academy of Sciences*, *119*(31), e2200732119.

Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: Improving decisions about health, wealth, and happiness*. Penguin.

Thaler, R. H., & Sunstein, C. R. (2021). *Nudge: The final edition*. Yale University Press.

Thaler (2021). Richard Thaler on "Nudge: The Final Edition" in Think Better Speaker Series (29:25 minutes).. Retrieved from <https://www.youtube.com/watch?v=KYuaKMrquYQ&t=1798s> on March 2023.

Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics*, 106(4), 1039–1061. DOI: [10.2307/2937956](https://doi.org/10.2307/2937956)

U.S. Department of Energy. (2022, April 26). Biden administration implements new cost-saving energy efficiency standards for light bulbs. Energy.gov.https://www.energy.gov/articles/biden-administration-implements-new-cost-saving-energy-efficiency-standards-light-bulbs

Xiao, Q., Lam, C. S., Piara, M., & Feldman, G. (2021). Revisiting status quo bias: Replication of Samuelson and Zeckhauser (1988)‎. *Meta-Psychology*, *5*. DOI: [10.15626/mp.2020.2470](https://doi.org/10.15626/mp.2020.2470)

Xiao, Q., Yeung, S. K., Dunleavy, D. J., Röseler, L., Elsherif, M., & Feldman, G. (2023) Effect sizes and confidence intervals guide. DOI: 10.17605/OSF.IO/D8C4G . Retrieved from: <https://osf.io/d8c4g/>