Title
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Publication Date
2023-09-01

DOI
10.1016/j.obhdp.2023.104277

Peer reviewed

Organizational Behavior and Human Decision Processes 178 (2023) 104277

Contents lists available at ScienceDirect

Organizational Behavior and Human Decision Processes

journal homepage: www.elsevier.com/locate/obhdp

The entrenchment effect: Why people persist with less-preferred behaviors

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ARTICLE INFO

Keywords:
Behavior change
Immersion
Entrenchment
Decision making

ABSTRACT

This research examines a perplexing but all too common phenomenon in which people actively forego nearly costless opportunities to switch from less-preferred tasks to preferred alternatives. The authors investigate such failures to change and identify a novel underlying cause—entrenchment, a state of heightened tedious task-set accessibility. A series of experiments demonstrate that a significant subset of participants choose to continue a less-preferred task when given an opportunity to change to a preferred alternative (Studies 1-4a). The more participants repeat a less-preferred task, the more difficult constructing a new task set feels, increasing the proportion who do not switch to their preferred task (Studies 2a-2b). Finally, disrupting task continuity attenuates entrenchment and increases switching (Studies 3-4b). This research contributes to the understanding of why people get stuck in ruts, continuing less-preferred activities when they could easily switch to better alternatives, and provides insights to help manage behavior change.

1. Introduction

People often get stuck in ruts, continuing unpleasant activities when they could easily switch to preferred alternatives. We deem such behaviors—continuing less-preferred tasks while passing up clear opportunities for improvement—behavioral ruts. Daily life is filled with instances of behavioral ruts—envision struggling to complete a task on your phone (e.g., sending a work email, reading a news story, or shopping) rather than switching to a nearby computer where you could do it more easily; or, consider continuing to watch a boring TV program rather than switching to the fun book conveniently located next to you on the side table; finally, envision a shopper awkwardly juggling an armful of groceries as they walk through a store rather than grabbing a nearby cart. In such instances, people have a goal (e.g., send an email, pass the time, finish shopping) and can choose to reach it either using a more or a less enjoyable method. While it seems that people would take the preferred approach, they frequently get stuck in a rut—choosing the less preferred path. In a survey of 118 adults, 94% reported having experienced behavioral ruts, and over 50% said they find themselves exhibiting them at least once a week. Behavioral ruts are perplexing and significant, detracting from individual, organizational, and societal well-being.

Consider Joe, who decides to spend an hour taking online surveys and finds his assigned task rather unenjoyable. Partway through, Joe is given an opportunity: continue the unpleasant task or switch to an alternative he prefers. While common sense suggests Joe would switch, we propose this may not necessarily be the case—rather, we predict Joe may choose to continue the less-preferred task. In this research, we seek to better understand behavioral ruts by studying the scenario Joe faced: we pay participants to complete a survey; they begin by doing a tedious task and we test what happens when they are given a chance to switch to a task they prefer for the remainder of the survey (for the same duration and while earning the same pay). Said differently, participants are given the opportunity to complete a paid survey—an activity analogous to many types of freelance work—either by continuing a task they prefer less or by switching to a task they prefer more. While a naive observer might expect everyone to switch to their preferred method of completing the survey, we predict and find that a significant subset continues the tedious task.

We investigate this phenomenon and explore the entrenchment effect—a state of increased tedious task-set accessibility ("entrenchment") that leads people to forego opportunities to switch to a preferred alternative. We predict that increased accessibility is one key explanation for behavioral ruts. Accessibility is a temporary state of knowledge activation that arises after processing a stimulus and can take many forms including but not limited to procedural, categorical, ideological,

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https://doi.org/10.1016/j.obhdp.2023.104277
Received 17 March 2022; Received in revised form 4 August 2023; Accepted 21 August 2023
Available online 2 September 2023
0749-5978/

and experiential (Förster & Liberman, 2007). Accessibility is often defined as the ease with which a construct comes to mind (Schwarz et al., 1991) and increases with frequency and recency[1] (Higgins, 1996; Nedungadi, 1990; Woolley & Sharif, 2022). We thus propose that entrenchment (i.e., the accessibility of the tedious task set) will increase with repetition (i.e., the more frequently a task is performed) and continuous engagement (i.e., greater recency). Moreover, because increased accessibility of one construct inhibits the activation of another (Bäuml & Aslan, 2004; Förster & Liberman, 2007; Hommel, 2015), the more entrenched a person becomes in the tedious task, the less accessible alternative task sets will become.

The accessibility of information influences judgments and behaviors—people think that events that come to mind more easily are more likely to occur (Tversky and Kahneman, 1973) and infer that more accessible behaviors are more likely to affect them (Schwarz et al., 1991). In a similar way, because entrenchment entails increased accessibility of a tedious task set (and decreased accessibility of alternatives), people infer that continuing with the tedious (but accessible) task will be easier while constructing a new task set feels difficult. Consequently, getting stuck in a rut—and failing to switch—becomes more likely. This feeling of difficulty can help explain the behavioral ruts described above. For the person typing (or reading) on their phone, it feels easier to struggle with the task at hand than to mentally reconfigure to the computer interface; for the person watching TV, it feels easier to continue watching TV than to switch to a reading mindset; to the shopper, it feels easier to continue piling groceries in their arms rather than break out of their rhythm to go get a cart. And, for Joe, it feels easier to simply continue with the tedious—but mentally activated—task than to mentally reconfigure and switch to an alternative he prefers. In such instances, any cognitive costs of switching (e.g., a minor delay in response time in the first trial after the switch) are small. Staying with the less desirable task due to this felt difficulty thus leaves people worse off, as the benefit of the change would outweigh the cost.[2]

While a variety of reasons are known to cause individuals to stick with existing courses of action, in this research we propose a contributing mechanism that is distinct from these previously studied explanations.[3] For example, people may *passively* remain with an existing option, even when it is inferior, because of ingrained habits (Ouellette & Wood, 1998; Wood, Quinn, & Kashy, 2002), having bypassed opportunities for improvement (i.e., inaction inertia; Tykocinski, Pittman, & Tuttle, 1995), inattention to outside options (Suri & Gross, 2015), or a lack of readiness to begin the focal behavior (Suri, Sheppes, & Gross, 2015). People may also fail to act in their best interest because of sunk costs (Arkes & Blumer, 1985), defaults (Madrian & Shea, 2001; McKenzie, Liersch, & Finklestein, 2006), behavioral friction (Mazar et al., 2021, 2022), felt losses, substantial transaction costs, or anticipated regret (Samuelson & Zeckhauser, 1988). Yet these effects and associated mechanisms cannot fully explain the behavior that we examine. In our studies, participants do not engage in the activity long enough to form a habit, they had not previously made decisions or passed up opportunities to improve their state (i.e., they are not acting out of consistency or inaction inertia), the forgone task is familiar and has been recently performed (i.e., they are ready to perform it), there are no potential losses (i.e., no sunk costs), external barriers to change are negligible (i.e., no behavioral friction), transaction costs are equated, and they actively choose whether to continue the less-preferred task or to switch to a preferred alternative (i.e., they cannot passively stay and there is no clear pre-set choice/default). Nonetheless, a significant proportion of participants in our studies fail to switch to their preferred task. Of course, human behaviors are complex and very often multiply determined. While we designed our studies to isolate the mechanism of interest, in daily life there are typically multiple co-occurring reasons that contribute to people getting stuck in ruts. In other words, in this research we propose and test a mechanism that is one driver of failures to make positive behavioral changes.

In sum, our research adds a novel explanation of why people sometimes fail to change suboptimal behaviors despite preferable, and easily obtainable, alternatives (e.g., switching to a computer, picking up that good book, choosing the preferred survey task, or grabbing a cart). Importantly, we believe that in addition to helping to explain the types of behavioral ruts we examine, the pathway underlying the entrenchment effect may also be a contributing explanation of other instances, including the abovementioned biases, in which individuals fail to make beneficial changes (e.g., status-quo bias). Our work thus contributes more broadly to the understanding of when and why people engaging in repetitive or continuous tasks may fail to change their behaviors.

2. Theoretical foundation

The tendency to stick with existing choices or behaviors has been studied extensively in the fields of Cognitive, Clinical, and Social Psychology, Judgment and Decision Making, Management, and Marketing. In this section, we draw on this literature to develop our theory of entrenchment and highlight it as one important driver of behavioral ruts.

2.1. Maladaptive persistence

The behavioral ruts we investigate are a form of perseveration—the continuation or repetition of a thought or behavior, even when it is no longer desirable or beneficial. Forms of perseveration have been documented in a range of clinical and cognitive contexts (e.g., Luchins, 1942; Sandson & Albert, 1984). Indeed, transferring a structure or solution from one situation to another is common in learning, problem-solving, decision making, new product development, and creativity paradigms (Dahl & Moreau, 2002; Gentner, 1983; Gick & Holyoak, 1983; Jansson & Smith, 1991; Marchant, Robinson, Anderson, & Schadewald, 1991). For example, once a problem-set has been solved, people often try and apply the same solution to future problems, even when simpler or better solutions exist (i.e., the Einstellung Effect; Luchins, 1942). Another related example is functional fixedness, in which the tendency to fixate on previously learned uses for objects or concepts limits one's ability to recognize nontraditional or novel ways to use them (Duncker, 1945).

Such maladaptive persistence has been attributed to cognitive resource competition, in which the increased accessibility of one mental structure, such as a schema or cognitive set, inhibits that of another. Schemas often guide our actions and behaviors (Norman & Shallice, 1986) and the more stable and accessible they are, the more resistant they are to change (Crocker, Fiske, & Taylor, 1984). In this way, our cognitive structures allow us to navigate the world in a less cognitively taxing and more efficient manner.

Because mental resources are limited (Kahneman, 1973), the activation or retrieval of one construct can inhibit that of another (Hommel, 2015; Förster & Liberman, 2007). For instance, when asking individuals to recall items from a previously viewed list, those who are given cues (e.g., shown some items on the list) have poorer recall of the non-cued items than those who were given no reminders—an effect attributed to the increased accessibility of cued items blocking retrieval of the others (Bäuml & Aslan, 2004). Thus, the accessibility of cognitive structures can, at times, lead to suboptimal outcomes. For instance, a leading explanation for the Einstellung Effect—people using a

[1] Salience or salience of similarity has also been shown to be a driver of accessibility (Barsalou, 1985; Menon, 1993; Woolley & Sharif, 2022). Across our studies similarity is mostly held constant as we focus on people becoming entrenched in a single tedious task. We thus focus on frequency and recency as antecedents of accessibility.

[2] Note that while persistence in a task can also arise in desirable situations (similar to Flow, which we refer to in the General Discussion; Csikszentmihalyi, 1990), we choose to study undesirable tasks where continuation is counterintuitive.

previously learned approach to try and solve a problem even when better solutions exist—is that previously learned solutions are the first that come to mind, blocking alternative approaches (Bilalić, McLeod, & Gobet, 2008). Indeed, within the management literature, stabilized schemas have been proposed as an explanation for why experts are often inflexible in devising problem-solving strategies, adapting to new situations, and generating creative ideas within their domain of expertise (Dane, 2010). That is, as expertise increases, so does the strength of one's domain schemas—these schemas are highly accessible and first to come to mind, blocking other approaches or considerations.

A related concept has received attention in the psychology and marketing literatures—most often under the term mindset. Similar to entrenchment, research on mindsets investigates scenarios in which cognitive processes display "stickiness" that can affect behaviors and decisions. The notion of mindsets most relevant to this research characterizes them as cognitive or motor procedures that, once activated, subsequently affect a behavior or choice in an unrelated task, context, or goal (Malkoc, Zauberman, & Bettman, 2010; Wyer & Xu, 2010, Xu & Schwarz, 2017), though mindsets have also been defined in other ways (e.g., implicit theories, persistence of goals; Dweck, 2008; Keinan & Kivetz, 2011). Consistent with the abovementioned research, this literature suggests that mindsets involve increased accessibility of connected cognitive processes (Wood, 2010) and the activation of these processes can persist across tasks and contexts (Xu & Schwarz, 2017). Different mindsets—e.g., deliberative versus implemental (Gollwitzer & Mayer, 1999), concrete versus abstract (Malkoc, Zauberman, & Bettman, 2010)—have been shown to influence a range of important decisions and behaviors. For instance, this research has found that activating a given mindset can affect subsequent decisions and behaviors in unrelated scenarios (Wyer & Xu, 2010), such as purchase decisions (Dhar, Huber, & Khan, 2007; Levav, Reinholtz, & Lin, 2012; Xu & Wyer, 2008), consumption choices (e.g., food selection; Wood, 2010), product acquisition (Xu, Schwarz, & Wyer, 2015), decision-making strategies (Ülkümen, Chakravarti, & Morwitz, 2010), creativity (Moreau & Engeset, 2016), and responses to persuasive messages (Xu & Wyer, 2012). We draw on this literature to support the notion that cognitive processes and procedures, once activated, become more accessible and thus influence important behaviors and decisions.

While much of the abovementioned work has examined how accessible structures can influence judgments, decisions, and behaviors in subsequent (and sometimes unrelated) contexts, recent work on binge watching behavior has investigated a related form of perseveration within a single media viewing session. Examining observational data, Shweidel and Moe (2016) find that as people watch more episodes—especially episodes from the same series—the more likely they are to continue watching; and the further along they are in a viewing session, the less responsive they are to advertisements. Relatedly, Woolley and Sharif (2022) find that viewing similar media consecutively (e.g., watching cat videos consecutively) leads people to choose to continue watching media within that same category (e.g., more cat videos) versus a different category (e.g., nature videos). The authors demonstrate that increased accessibility of the media category driven by similarity, repetition, and consecutiveness, leads people to anticipate continuation of that category to be more enjoyable than a different category. The current research also proposes maladaptive persistence within a single context (choice of task to achieve some goal or outcome) that results from increased accessibility.

Importantly, however, while this previous research specifically examines media consumption and investigates anticipated enjoyment in continuing similar (vs. dissimilar) media categories, the current research investigates more generally when and why people fail to switch from a tedious (i.e., less enjoyable) task or behavior to a preferred (i.e., more enjoyable or liked) one and how accessibility influences felt difficulty of constructing an alternative task set.

2.2. Increasing accessibility and entrenchment

Two key drivers of accessibility are frequency of activation and recency (Higgins, 1996; Nedungadi, 1990; Woolley & Sharif, 2022). First, we predict that the more people repeat a tedious task (i.e., greater frequency of the task), the more accessible the tedious task set will become—that is, the more entrenchment will increase. Second, we predict that performing a task continuously (i.e., greater recency of the tedious task), will increase entrenchment compared to performing a tedious task intermixed with another task. This builds on research demonstrating that when alternating between tasks, people must reconfigure the task set with each switch (Kiesel et al., 2010; Vandierendonck, Christiaens, & Leifooghe, 2008), inhibiting the stabilization of a task set and thus preventing an increase in accessibility. Indeed, category accessibility increases with consecutive (vs. alternating) consumption (Woolley & Sharif, 2022), and people become more immersed (i.e., directing their full attention) in an activity the longer they engage in it without interruption (Brown & Cairns, 2004; Jennett et al., 2008).

2.3. Felt difficulty of constructing an alternative task set

Building on the previous literature, we propose that performing a tedious task *repeatedly* and *continuously* increases entrenchment. The more entrenched one becomes in a tedious task, the more accessible the task set becomes, reducing the accessibility of alternatives. Said another way, as entrenchment increases, the tedious task set comes to mind with greater ease while alternative task sets become more difficult to mentally construct. As a result, continuing with the activated task feels less effortful than constructing an alternative task set. We propose that people use this feeling of ease (or conversely felt difficulty) in their decision whether to stay or to switch, failing to recognize the benefit switching would bring.

Our theory of felt difficulty is supported by previous work showing that the emotions associated with cognitive processes can drive judgments and behaviors (Schwarz, 1990; 2000; 2004; 2011). In particular, people use the subjective ease with which something comes to mind as an inference in making judgments (Schwarz et al., 1991). For instance, because it is more difficult for people to recall *many* examples of a behavior compared to recalling *few*, participants asked to recall many examples of risky behaviors conclude that they themselves are at less risk than those asked to recall few (Schwarz, 2005). In a similar way, we propose that because a non-activated task is harder to mentally construct, people use that feeling of difficulty as information and choose not to switch (see Fig. 1). Mentally reconfiguring when switching tasks can indeed lead to some cognitive costs—often manifested by lower accuracy and/or greater response time on the first trial after switching (Monsell, 2003). We suggest, however, that in the scenarios we examine, any small cost of making a change (e.g., a few milliseconds slower response time in the first trial after the switch) would be outweighed by the benefit of switching. Indeed, as we will demonstrate, in the contexts that we study a decision not to switch leaves participants worse off.

3. Overview of studies

The present research illustrates that the more people continuously repeat a task—even one that is quite tedious—the more entrenched they become. Entrenchment is the increased accessibility of a tedious task set that then reduces the accessibility of alternatives. This increased accessibility makes mentally constructing an alternative task set—even for a task that is preferred—feel difficult, causing behavioral ruts. A series of experiments demonstrate that a significant subset of participants actively choose to continue less-preferred tasks rather than switch to alternatives they prefer (Studies 1-4a), and that this increases with greater repetition of the less-preferred task (Studies 2a-2b). We show that one reason for this is an increase in the felt difficulty of change (Study 2a). We provide support for our accessibility mechanism by

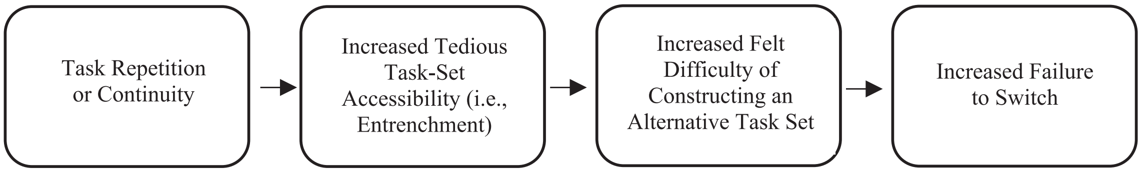

Fig. 1. Heightened tedious task-set accessibility (i.e., entrenchment) leads to a greater felt difficulty of constructing an alternative task set, thereby increasing the likelihood participants fail to switch to a preferred alternative.

showing that intermixing the tedious task with another task, thereby interrupting task continuity, lessens entrenchment (tedious task-set accessibility) via a thought-listing paradigm (Study 4b). Finally, we present methods to reduce entrenchment: we demonstrate that the entrenchment effect is attenuated by decreasing repetition (Study 2b) or disrupting task continuity (Studies 3, 4a, S1). We report our predetermined sample sizes, all data exclusions, all manipulations, and all measures in the main text and Web Appendix. Materials and data are available on the Open Science Foundation (OSF) website (https://osf.io/wr3ac/?view_only=9863ddc2f2c14a5a8bc160c119033588).

4. Pilot study: Participants who do not switch are worse off

In the main studies, participants set out to complete a survey; they begin with a tedious task and are then given the explicit choice to continue the current task or to switch to a preferred task while earning the same pay for the remainder of the survey. This design allows us to isolate the mechanism of interest—entrenchment—while controlling for alternative explanations where individuals passively remain with existing states. Note that in passive-staying designs—paradigms in which participants are not required to actively make a choice between switching or staying—participants may not be fully conscious of the option to switch. In contrast, our studies require them to attend to the choice options. As a result, our explicit choice design represents a conservative test of the entrenchment effect, as forcing participants to attend to the choice option may itself reduce entrenchment (see Web Appendix A-L for design details and materials for all studies).

This pilot study tested whether those who forgo the opportunity to switch are indeed worse off, as we suggest. Participants began the tedious task and, partway through, half of them were automatically switched to their preferred task (and half were not). If participants who were automatically switched report greater satisfaction than those who were not switched, this would support our conjecture that participants who fail to switch to their preferred task when given the opportunity to do so will be worse off.

4.1. Method

We pretested and selected tasks that were perceived as tedious ("less-preferred tasks") and tasks that were perceived as fun ("preferred tasks"). In the main studies, participants were assigned to a less-preferred task and then given the option to switch to a preferred one. The less-preferred tasks used across studies included: (1) transcribing highlighted lines of a paragraph rotated 90 degrees (to reduce the likelihood that participants would be motivated by a need to complete the paragraph, the highlighted lines started and ended in the middle of the paragraph) and (2) counting the "e"s appearing in a page of text. The preferred tasks included: (1) playing a Boggle-like word game; (2) playing Where's Waldo; and, (3) rating comics (see Web Appendix A for pretest details).

At the beginning of each study, participants try out and rate several tasks, including the less-preferred task and the more-preferred task. Thus, we know which task each participant prefers. While the tasks we designed to be inferior were significantly less preferred on average, there was some natural heterogeneity in preferences. We thus focus specifically on participants who prefer the task that was designed to be more fun, as including participants who subjectively prefer the inferior task (and would thus prefer not to switch) would artificially inflate our results. In other words, for a conservative test of our hypotheses, the analyses in this and all studies in the paper include only participants who rated the fun task as more likable or enjoyable.

We targeted 300 participants. Three hundred two adults from Amazon Mechanical Turk completed the study in exchange for payment ($M_{age} = 34.14$, $SD_{age} = 9.71$, 45% female). Participants read that we (the researchers) needed help with a handful of different tasks and that the computer would randomly assign them to one. They were informed that the tasks consisted of multiple rounds and that if not enough participants were assigned to a single task the computer may switch them to one of the other tasks for the remaining rounds. They were further assured that if this were to occur, it would not influence the total number of rounds they complete. After reading the instructions, participants completed a practice round of five different tasks (transcribing paragraphs rotated 90 degrees, playing a Boggle-like word game, writing captions for fun photos, completing captchas, and categorizing stock photos) and were asked to rate how enjoyable they thought each task would be.[3] On the next page, they were randomly assigned to one of two conditions: (1) transcribe only (participants completed 10 rounds of the tedious sideways transcription), or (2) automatically switched (participants completed 7 rounds of transcription before being informed that too many participants had been assigned to the transcription task and were switched to the more enjoyable word game for the remaining 3 rounds).

After completing 10 rounds of tasks, participants responded to a 3-item scale ($\alpha = 0.9$) designed to measure their satisfaction with the HIT (the term used for the surveys or assignments posted on Amazon Mechanical Turk): "How much fun was this HIT"; "How pleasant was this HIT"; "How tedious was this HIT?" on seven-point scales (1 = *not at all*, 7 = *very*; the final item was reverse coded). To provide convergent validity, on the next page, participants were asked "How much did you like this HIT?" on a continuous sliding scale from 0 to 10. Finally, here and in all studies that follow, participants responded to several demographic items and robustness checks (see Web Appendix A-J for all ancillary measures).

4.2. Results and discussion

As predicted, among participants who a priori preferred the word game ($n = 188$), those who were automatically switched to the game for 3 of their 10 rounds reported significantly greater satisfaction ($M = 3.36$) than those who transcribed for all 10 rounds ($M = 2.02$), $t(165.68) = 6.34$, $p < .001$, $d = 0.94$, equal variances not assumed. To illustrate that the effect was driven by a general shift in the distribution rather than by outliers, we conducted a median quantile regression which revealed the predicted effect of condition on satisfaction ($Mdn_{transcribe\_only} = 1.33$ vs. $Mdn_{switched} = 3.33$), $b = 2.00$, $t(186) = 6.96$, $p < .001$.

The item measuring how much participants liked the HIT highly correlated with their overall satisfaction, $r(186) = 0.89$, $p < .001$.

[3] In this study, along with Studies 1-2b, participants were also asked how familiar they thought others were with each type of task. This item was simply included to reduce the likelihood that participants might guess the purpose of the study, thus we do not discuss it further.

Participants who were automatically switched reported liking the HIT significantly more ($M = 4.98$) than those who transcribed all 10 rounds ($M = 2.77$), $t(173.07) = 5.65$, $p < .001$, $d = 0.83$, equal variances not assumed. Similarly, an analysis using median quantile regression revealed the predicted effect of condition on liking ($Mdn_{transcribe\_only} = 1.93$ vs. $Mdn_{switched} = 5.43$), $b = 3.50$, $t(186) = 5.05$, $p < .001$. These results suggest that participants who were automatically switched to their preferred task were indeed more satisfied than those who endured the less-preferred task for the entirety of the study. Importantly, these findings suggest that neither increased task-experience nor small switching costs would cause the value of staying to overshadow the value of switching. Thus, these results suggest that in future studies, participants who forgo the opportunity to switch to their preferred task will be worse off.

5. Study 1: Failure to change

Study 1 tested our prediction that a significant subset of participants would fail to switch to their preferred task when given an explicit opportunity to do so. Participants were presented with the scenario described in the introduction: they began a survey and at the outset were assigned a tedious task; partway through they were given the opportunity to switch to an alternative task they preferred for the remainder of their time. We predicted that although switching to their preferred task would be in their best interest (as demonstrated in the pilot study), a significant proportion would fail to do so.

Study 1 also sought to rule out two alternative explanations. First, we tested whether participants would still fail to switch to their preferred task even when the transaction costs were equated, such that participants had to actively either push a button to stay or push a button to switch. Second, we examined whether participants would persist with the less-preferred task when the task set stayed the same (i.e., transcribing sideways text) but the content changed (i.e., transcribing a different paragraph), making the prospect of a completion goal less likely. That is, if participants chose to continue the tedious task in this condition, this would be consistent with our proposition that they were entrenched in the *task set* (i.e., the task procedures were activated and accessible) and did not simply choose to stay in order to try and complete the transcription for their specific paragraph.

5.1. Method

We targeted 900 participants. Nine hundred seven adults from Amazon Mechanical Turk completed the study in exchange for payment. Participants read similar instructions to those in the Pilot Study—that we, the researchers, were requesting help with a handful of different tasks and that the computer would randomly assign them to one of these tasks. They were further informed that in order to equate the number of participants across tasks, they may be given an opportunity during the experiment to switch to a different task for the remainder of their time. Participants completed a practice round and rated the enjoyability of 5 tasks, including the tedious (sideways transcriptions) and fun task (Boggle-like word game). Participants rated multiple tasks that ranged in enjoyability in order to increase the realism of our cover story and decrease suspicion that they were purposefully assigned to the tedious task.

On the next page, all participants were informed that they had been randomly assigned to complete 10 rounds of the transcription task. As individuals began their 6th round of transcription, a dialogue box appeared, offering them the opportunity to continue transcribing or switch to the word game for the remaining rounds. Participants randomly received 1 of 3 switch opportunities: control (click a button to switch to the word game, or simply continue transcribing to stay); cost-equated (click a button to switch to the word game, or click a button to continue the current task); or new paragraph (click a button to switch to the word game, or click a button to switch to a new paragraph and keep transcribing). The new-paragraph condition was designed to reduce the likelihood that participants would continue with the tedious task out of a desire to finish typing that specific paragraph (i.e., a completion goal; Förster, Liberman, & Friedman, 2007). Thus, we tested whether participants would forgo the opportunity to switch to their preferred task even when there was no difference in the physical transaction cost (cost-equated condition) and when the task itself remained the same (i.e., the same task set was activated), but a completion goal was unlikely (new-paragraph condition). Everyone then completed the additional rounds of the task they chose.

Our primary dependent variable is the proportion of participants who choose to continue the less-desirable task. The theoretical null hypothesis is that no participants will choose to continue their less-preferred task when given a nearly costless opportunity to switch to a preferred alternative.

However, according to Necka et al. (2016) a subsample of Mturk workers report either beginning studies without fully reading the instructions (10.2%) or responding to questions without really thinking about the question first (8.6%). To account for such error in our studies (participants inadvertently choosing their less-preferred task), we conducted a pretest to assess what proportion of participants who prefer the fun task would erroneously choose the transcription task when not entrenched. This study was preregistered at https://aspredicted.org/7WG_H26. Participants ($N = 149$) read the same instructions as the main experiment, rated the enjoyability of 3 tasks, and were then assigned the tedious task. Participants were then randomly assigned to one of two conditions: benchmark (i.e., in which *prior to beginning the task*, participants received the option to continue with the current task or to switch to the boggle task for the remaining rounds) vs. entrenched (on their 6th round of transcription, participants received an opportunity to continue with the current task or switch to the boggle task for the remaining rounds). Among participants who preferred the word game ($n = 95$), significantly more chose to continue the tedious transcription task in the entrenched condition (24.39%; 95% CI [13.83, 39.34]) compared to the benchmark condition (7.41%; 95% CI [0.03, 17.55]), χ^2 (1, $n = 95$) = 5.35, p =.021, $\phi = 0.24$. Across the main studies, all analyses are limited to participants who preferred what is, on average, the more fun task. In the applicable experiments, we examine whether the null hypothesis (0%) and pretested benchmark (7.41%) fall outside the 95% confidence intervals for the proportion who stay with their less-preferred task.[4] To be conservative, for all confidence intervals we present Wilson score intervals. In addition, we use an exact binomial test to assess whether the proportion of participants who chose to stay is significantly greater than the pretested benchmark rate of 7.41%.[5]

5.2. Results and discussion

Among participants who preferred the word game ($n = 618$), 23.14% (95% CI [19.99, 26.62]) chose to continue their less-preferred task rather than switch when given the opportunity. The CI for this proportion does not include 0% (the null hypothesis) or 7.41% (the pretested benchmark). An exact binomial test indicates the proportion who chose

[4] This method aligns with the interpretation of confidence intervals offered by Cumming and Finch (2005; pg. 174): “a range of plausible values for μ. Values outside the CI are relatively implausible.”

[5] To account for the sampling error in both the benchmark pretest and the comparison studies, we ran additional analyses using Rule of Eye 4 as described by Cumming and Finch (2005, pg. 176). This involved comparing the proportion overlap between the confidence interval of the stay-rate in the benchmark condition to the confidence intervals of the stay-rates in Studies 1, 2b, 3, and S1. These analyses were performed using both asymptotic CIs and Wilson score intervals. The results indicate that all comparisons presented in the paper remain statistically significant using this approach. See Web Appendix M for additional detail.

to stay (23.14%) is also significantly greater than the benchmark of 7.41% ($p < .001$). Importantly, compared to the control condition, the proportion of participants who stayed with their less-preferred task did not differ in the cost-equated (control: 24.54% vs. cost-equated: 22.49%), χ^2 (1, n = 425) = 0.25, p =.619, ϕ = 0.02, or in the new-paragraph condition (22.28%), χ^2 (1, n = 409) = 0.29, p =.59, ϕ = 0.03 (see Fig. 3). These results suggest that some participants appear to have indeed gotten stuck in a rut: a significant subset of participants who preferred the fun task actively chose to continue their less-preferred method to complete the survey, even when the cost to switch to a preferred method was equated (click a button to switch or click a button to stay) and when continuing to transcribe meant they would continue the activated task set but transcribe a different paragraph, reducing concerns of a completion goal.

6. Study 2a: Felt difficulty of switching increases with repetition

Study 2 had two goals. First, Study 2a tested the relationship between task repetition and the felt difficulty of switching to a different task. Accessibility increases with frequency of activation (Bargh & Pietromonico, 1982; Wyer & Xu, 2010). We thus expected more task rounds to boost the accessibility of task-related procedures, making switching tasks (which requires the construction of an alternative task set) to feel more difficult. Second, Studies 2a-2b aimed to further rule out alternative explanations related to goal gradients (Locke & Latham, 1984). Specifically, whereas in Study 1 participants were told that they would complete 10 rounds of the task, in Studies 2a-2b participants were told that the number of rounds they would complete depended on exogenous factors. Thus, at the point of the switch opportunity, participants did not know exactly how many task rounds remained until the end of the task, reducing the likelihood that they factored this information into their decision of whether to switch or to stay. Finally, because asking participants to report felt difficulty of switching could break entrenchment (similarly to the challenge of measuring immersion; Cheng & Cairns, 2005), we measure felt difficulty in Study 2a and examine switching behavior separately in Study 2b.

6.1. Method

We targeted 600 participants. Five hundred ninety-five adults from Amazon Mechanical Turk completed the study in exchange for payment (M_{age} = 34.66, SD_{age} = 10.35, 44% female). Participants read instructions similar to those of Study 1, except that the number of rounds of the task was uncertain (i.e., infinite horizon): they were informed that the number of rounds they would complete depended on the number of other participants doing the task. We designed the study such that the number of task rounds prior to the switch opportunity varied while the number of rounds after the switch opportunity was consistently uncertain. That is, since participants did not know exactly how many task rounds they would do, in theory, each round could have been their last, or there could have been more ahead of them. Participants' choice to switch or to stay would thus be influenced by how frequently they repeated the task while holding constant how much remained—as this was consistently uncertain across conditions. Hence, it would be less likely for participants' decisions to be influenced by considerations of exactly how many task rounds they had yet to complete.

Participants completed a practice round and rated the 2 tasks (transcription and Boggle-like word game). On the next page, they were all assigned to transcription. At various points during the task, participants were presented with a screen asking them to imagine that they were given the opportunity to either continue the transcription or to switch to Boggle. Specifically, participants were randomly assigned to read about this switch opportunity either: on the third round (low-entrenchment condition); on the sixth round (medium-entrenchment condition); or, on the ninth round (high-entrenchment condition). At this point, participants rated 7 items designed to measure how difficult it would *feel* to switch tasks (α = 0.94). Specifically, using 7-point scales they were asked to what extent switching would feel annoying, effortful, bothersome, pointless, easy, pleasant, refreshing (1 = *not at all*, 7 = *very*). The items were asked in randomized order and the three positively valenced measures were reverse-coded. Participants were asked about the felt difficulty of switching—as opposed to the felt difficulty of constructing an alternative task set—as it is likely easier to self-report.

Participants were asked to imagine that on the previous page they had been given the opportunity to continue transcribing or switch to Boggle for the remaining rounds and then indicated what they would have chosen (continue transcribing or switch to Boggle). On the following page, they read that in the past, participants who chose to switch (or to stay) had given a list of reasons why they made that choice and indicated how applicable each reason was for them (see Web Appendix E).

6.2. Results and discussion

As predicted, among participants who preferred the word game a priori (n = 322), those in the high-entrenchment condition anticipated that switching tasks would feel significantly more difficult than participants in the low-entrenchment condition (M_{high} = 2.82 vs. M_{low} = 2.15), b = 0.67, t(319) = 3.09, p =.002, d = 0.42, and in the medium-entrenchment condition (M_{medium} = 2.37), b = 0.45, t(319) = 2.11, p =.036, d = 0.27. Participants were also more likely to report that they would have chosen to stay with their less-preferred task in the high-entrenchment condition (25.49%; 95% CI [18.03, 34.72]) than the low-entrenchment condition (11.93%; 95% CI [7.10, 19.34]), χ^2 (1, n = 211) = 6.43, p =.011, ϕ = 0.17, and the medium-entrenchment condition (18.92%; 95% CI [12.72, 27.19]), though this latter difference was not statistically significant, χ^2 (1, n = 213) = 1.33, p =.248, ϕ = 0.08.

To test whether the reduced switching rate in the high-entrenchment condition was driven by the felt difficulty of switching, we conducted a mediation analysis with 1,000 bootstrapped samples (Hayes, 2013). The number of paragraphs completed served as the continuous independent variable (2, 5, 8), the felt difficulty scale as the mediating variable, and the choice to switch (1/0) as the dependent variable. A linear regression fit with least squares was used for the mediator model and a probit regression was used for the outcome model. This analysis confirmed that the felt difficulty of switching mediated the effect of entrenchment on participants' anticipated choice to continue the tedious task (95% CI [−0.02, 0.00]; see Fig. 2). These results suggest that the more participants repeated the task, the more entrenched they became, making switching feel more difficult and reducing the likelihood that they would switch if given the opportunity.

7. Study 2b: Switching decreases with repetition

Study 2b directly tested whether the more participants repeated the less-preferred task the less likely they would be to switch to their preferred alternative. Whereas in Study 2a participants were asked about the *felt difficulty of switching* at various periods during the task, in Study 2b they were given the opportunity to switch to their preferred task at these same points. We expected that the more participants repeated a task, the more difficult switching would feel (as shown in Study 2a), and the less likely they would be to switch to their preferred task.

7.1. Method

We targeted 450 participants. Four hundred fifty adults from Amazon Mechanical Turk completed the study in exchange for payment. After reading the same instructions as in Study 2a, participants tried and rated 5 different tasks and were then assigned to the transcription task with an uncertain number of rounds. Participants were again randomly assigned to receive the switch opportunity either on the third round (low-entrenchment condition); on the sixth round (medium-entrenchment condition); or on the ninth round (high-entrenchment condition). In this study, everyone received the cost-equated switch opportunity presented in Study 1, where they had to press a button to switch or press a button to stay. Though participants did not know this ahead of time, each of them completed a total of ten task rounds.

7.2. Results and discussion

Replicating our earlier findings, among participants who preferred the word game ($n = 313$), 21.09% (95% CI [16.93, 25.94]) actively chose to continue their less-preferred task. The CI for this proportion does not include 0% (the null hypothesis) or 7.41% (the pretested benchmark). An exact binomial test indicates the proportion who chose to stay (21.09%) is significantly greater than 7.41% ($p < .001$). Participants were more likely to stay with their less-preferred task in the high-entrenchment condition (27.55%) than in the low-entrenchment condition (15.74%), χ^2 (1, $n = 206$) = 4.27, $p = .039$, $\phi = 0.14$, and the medium-entrenchment condition (20.56%), though the latter difference was not statistically significant, χ^2 (1, $n = 205$) = 1.37, $p = .241$, $\phi = 0.08$ (see Fig. 3).

Results of Studies 2a and 2b support our prediction that the more one repeats a task, the more difficult it feels to switch and the less likely one is to do so. These findings are consistent with our notion that repetition increases entrenchment. Indeed, participants in the high-entrenchment (vs. low-entrenchment) condition were nearly twice as likely to stay with their less-preferred task. Note that these results do not support a goal-gradient argument (Kivetz, Urminsky, & Zheng, 2006), as participants did not know when the task would end.

One potential alternative explanation for these findings is that the more participants are exposed to a task, the more they like it (mere exposure; Zajonc, 1968). To test whether task enjoyment increased with repetition, we conducted a pilot study in which participants (N = 199; $M_{\text{age}} = 37.87$, $SD_{age} = 12.58$, 63% female) completed an enjoyment scale either on the third round of the transcription task (low-entrenchment) or on the ninth round of the task (high-entrenchment). Specifically, the scale included 4-items ($\alpha = 0.86$) asking participants to rate the extent to which they found the task fun, annoying, fulfilling, and tedious on 10-point scales (1 = *not at all*, 10 = *very*). There were no significant differences in enjoyment of the transcription task between participants in the low- versus high-entrenchment conditions ($M_{low} = 4.65$ vs. $M_{high} = 4.41$), $t(194.17) = 0.69$, $p = .492$, $d = 0.10$, equal variances not assumed. Participants were also informed that some other Mturkers had been assigned to the word game and asked how much they thought they themselves would enjoy the transcription task relative to the word game (−50 = *enjoy the transcription task much more*, 0 = *enjoy the tasks equally*, 50 = *enjoy the word game much more*). Across both conditions, participants reported no differences in anticipated preference for the word game relative to the transcription task ($M_{low} = 24.62$ vs. $M_{high} = 24.14$), t (187.15) = 0.12, $p = .904$, $d = 0.02$, equal variances not assumed. Thus, the results of Studies 2a-2b are difficult to explain by mere exposure, familiarity, or increased enjoyment.

8. Study 3: Disrupting continuity increases switching

Study 3 tested whether having participants perform intermixed tasks, thus disrupting task continuity, would increase switching. Consecutive consumption (i.e., greater recency) has been shown to increase accessibility (Woolley & Sharif, 2022). Thus, we predicted that performing a tedious task intermixed with another task (vs. performing the tedious task continuously) would attenuate entrenchment and increase switching.

8.1. Method

We targeted 800 participants. Eight hundred and fifty-four participants from Amazon Mechanical Turk completed the study in exchange for payment ($M_{\text{age}} = 37.96$, $SD_{age} = 12.19$, 57% female). Participants read instructions similar to those in the previous studies and were then randomly assigned to either perform the tedious transcription task continuously (continuous condition), or to perform four rounds of the tedious transcription task with two rounds of another task interspersed between transcriptions (intermixed condition). Before beginning their task, participants did a "training session," in which they performed practice rounds and rated two tasks: the (less-preferred) transcription task and the (more-preferred) Where's Waldo task. Participants in both conditions started the training session by first trying and rating one Where's Waldo and then trying and rating one transcription, so that the preference ratings were similarly acquired for both conditions.[6] As part of the training session, participants in the continuous condition completed 3 rounds of Where's Waldo and 1 round of transcription, while participants in the intermixed condition completed 1 round of Where's Waldo and 3 rounds of transcription. On the next page, participants began their task session. The training session and task session were purposefully designed as two separate sections so that participants in both conditions would perform the same total number of task rounds during the experiment (3 Waldos and 7 transcriptions) but would construe their "task session" as comprising either continuous transcriptions or transcriptions intermixed with Waldos. To clarify, if T represents transcription, W represents Where's Waldo, and * represents the switch opportunity, tasks appeared in the following order in the continuous condition: W-T-W-W—T-T-T-T-T-T-T*, and in the intermixed condition: W-T-T-T—T-T-W-T-W-T-T*. The first 4 task rounds were the "training session," and the next 6 the actual "task session." The final transcription task cutoff was the choice to switch or to stay.

At the start of the task session, all participants read that they were assigned to the transcription task. Participants in the intermixed condition additionally read that we needed a few more Where's Waldos completed and that they would be interspersed as short breaks between the transcriptions. Participants in the continuous condition then did 6 rounds of transcription in a row and on the start of their 7th round were given the opportunity to continue with their task or switch to Where's Waldo for their remaining time. In contrast, participants in the intermixed condition completed 4 rounds of transcription with 2 Where's Waldos interspersed, and at the start of their 7th round (a transcription) were given the opportunity to continue with their task or to switch to Where's Waldo. The order in which participants completed tasks in the intermixed condition was designed to be nonuniform (T-T-W-T-W-T-T*) so that no clear pattern might influence their switch decision. Participants decided whether to continue their less-preferred task or switch to their preferred task, after which they were informed that enough tasks had been performed and no additional tasks needed to be completed.

8.2. Results and discussion

Consistent with our theory, among participants who preferred Where's Waldo ($n = 656$), significantly fewer participants in the intermixed condition stayed with their less-preferred task (21.77%; 95% CI [17.58, 26.63]) compared to those in the continuous condition (29.79%; 95% CI [25.17, 34.87]), χ^2(1, $n = 656$) = 5.50, $p = .019$, $\phi = 0.09$ (see Fig. 3). In both the intermixed and continuous conditions, the CIs for the proportion who stayed with the tedious task do not include 0% (the null hypothesis) or 7.41% (the pretested benchmark). Exact binomial tests indicate the proportion who chose to stay in both conditions (21.77%

[6] Whereas in the previous studies after testing each task preference ratings were elicited by having participants rate how enjoyable they thought the task would be, in Studies 3-4b they reported how much they like the task.

and 29.79%) was significantly greater than 7.41% ($ps < 0.001$).[7]

Thus, having participants perform intermixed tasks attenuated—but did not eliminate—entrenchment and increased the proportion who switched to their preferred task. Further, in this study, participants in both conditions performed the same number of less-preferred task rounds (7) and more-preferred task rounds (3) before being given the opportunity to switch. Thus, our findings suggest that participants' choice whether to switch or to stay was not heavily influenced by experience with the task, task familiarity, or considerations of variety-seeking.

Switching between tasks also naturally occurs when dual-tasking (doing two tasks at once). Thus, our theory predicts that disrupting entrenchment via dual-tasking would also lead to increased switching. We test and find support for this conjecture in an additional study that is presented in Web Appendix K-L (Study S1). The findings of both Studies 3 and S1 suggest that disrupting continuity of the tedious task, either by intermixing tasks or dual-tasking, attenuates entrenchment and increases switching likelihood.

9. Study 4a: Intermixing tasks increases switching

Study 4 had several goals. First, Study 4a tested the generalizability of our previous findings by using two different tasks. Specifically, participants were assigned to do a tedious task of counting "e"s and presented with the opportunity to switch to a fun task of rating comics. In addition, Study 4a tested whether participants who do a task continuously would still be less likely to switch from a tedious task even when time on task was more tightly controlled in a behavioral laboratory.

Study 4 also more directly tested the relationship between task continuity, increased accessibility, and task switching. Similarly to Study 2a-2b (cf. Cheng and Cairns 2005), and following the method of Woolley and Sharif (2022), we measured switching behavior and accessibility in two separate experiments. In both studies we assign participants to do a tedious task either continuously or intermixed with another task. In Study 4a we assess switching behavior while in Study 4b we examine task accessibility. We predicted that performing tasks continuously would increase task-set accessibility, thereby increasing the likelihood of staying with the tedious task.

9.1. Method

This study was preregistered at https://aspredicted.org/NZ1_GL8. The study ran in the behavioral laboratory of a large West Coast University over 8 days.[8] Five hundred eighty three undergraduates participated in exchange for course credit ($M_{age} = 20.87$, $SD_{age} = 1.87$, 56% female).[9]

The design of this study was similar to that of Study 3 but with two different tasks: the tedious task involved counting the letter "e" in a block of text (counting) while the preferred task was to rate comics (comics). Before beginning their task, participants did a "training session," in which they performed practice rounds and rated the two tasks, they then were assigned to perform the tedious task either continuously (continuous condition) or with the rating comics task interspersed between counting tasks (intermixed condition).

Following the design of Study 3, the training session and task session were purposefully designed as two separate sessions so that participants in both conditions would perform the same total number of tasks during the experiment (3 comics and 6 counting) but would construe their "task session" as comprising either continuous counting tasks or counting intermixed with comics. Participants in both conditions started the training session by first trying and rating one comic task and then trying and rating one counting task. Next, as part of the training session, participants in the continuous condition completed 2 rounds of comics, while participants in the intermixed condition completed 2 rounds of counting.[10] On the following page, participants began their task session. In the continuous condition, participants did 5 rounds of counting before receiving a switch opportunity on their 6th round. In contrast, participants in the intermixed condition did 3 rounds of counting with 2 comics intermixed before receiving a switch opportunity on their 6th round (a counting task). That is, if E represents counting "e"s, C represents rating comics, and * represents the switch opportunity, tasks appeared in the following order in the continuous condition: C-E-C–C—E-E-E-E-E-E*, and in the intermixed condition: C-E-E-E—E-E-C-E-C-E*. Participants decided whether to continue their less-preferred task or switch to their preferred task, after which they were informed that enough tasks had been performed and no additional tasks needed to be completed.

9.2. Results and discussion

As predicted, and replicating the findings of Study 3, among participants who preferred rating comics ($n = 489$), significantly fewer participants in the intermixed condition stayed with their less-preferred task (7.38%; 95% CI [4.72, 11.36]) compared to those in the continuous condition (13.06%; 95% CI [9.41, 17.86]), $\chi^2(1, n = 489) = 4.30$, $p = .038$, $\phi = 0.09$ (see Fig. 3).[11] In both conditions, the CIs for the proportion who stayed with the tedious task did not include 0% (the null hypothesis).[12] Thus, replicating the findings of Study 3 with two different tasks and in the behavioral lab where time is more tightly controlled, having participants perform intermixed tasks increased the proportion who switched to their preferred task.

10. Study 4b: Intermixing tasks decreases entrenchment

Study 4b directly tested whether intermixing tasks decreases accessibility. Our theory posits that increased accessibility causes people to continue with less-preferred tasks; we therefore predicted that preventing an increase in accessibility would lead to greater likelihood that individuals make a beneficial switch. In Studies 3 and 4a we demonstrated that intermixing tasks increased the proportion who switched to their preferred task when given the opportunity to do so. In Study 4b we tested the mechanism underlying this behavior via a thought-listing paradigm. We predicted that a tedious task would be more accessible for participants who do the tedious task continuously (vs. those who do

[7] Note that while this design was slightly different than that used in the benchmark study, we compare the stay-rates in this study to the benchmark study as the tedious task and sample populations were the same.

[8] While we preregistered that this study would start running on 11/22/2022, due to constraints in the behavioral lab it started on 11/23/2022.

[9] At the conclusion of the study, it was discovered that 36 participants took it twice. As participants were only meant to take the study once, and to be conservative, for these 36 participants we removed the data for the *second* time they participated. The main dependent variable (likelihood of switching) remains significant without these exclusions.

[10] After the first 18 participants took the survey, the instructions for the counting task were clarified slightly (e.g., placing parentheses around "e" in the instructions to count the "e"s) to ensure participants understood the task.

[11] After completion of the study, it was discovered that 84 students (65 who preferred the comics) took a very similar, but not identical, pilot version of this study – the study differed in that the tedious task was an entirely different task (notably while the task in the pilot study was designed to be tedious, it was not particularly rated as such). These participants were not removed from the study as (1) this was not a preregistered exclusion; (2) the "tedious task" was completely different, and (3) it would underpower the sample. Without these participants, among those who prefer the comic task ($n = 424$), the difference between conditions on switch rates becomes marginal (8.21% versus 13.36%), $\chi^2(1, n = 424) = 2.91$, $p = 0.088$, $\phi = 0.08$.

[12] Note that in this study we compare the stay-rates only to the null hypothesis (0%) as both the tasks and the sample population were different than those in the benchmark study.

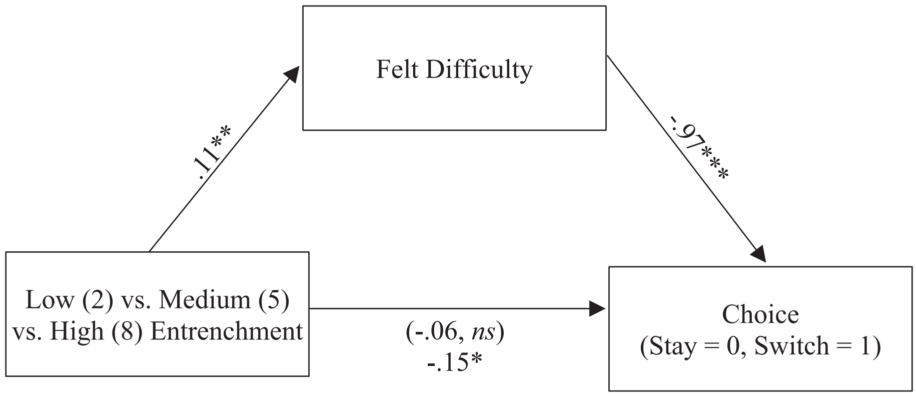

Fig. 2. The effect of task repetition on choice of whether to switch or to stay is mediated by felt difficulty of switching, Study 2A. The path coefficients are unstandardized betas. The value in parentheses indicates the effect of the number of task rounds on choice after controlling for the mediator (*$p < .05$, **$p < .01$, ***$p < .001$).

it intermixed with another task) and, as a result, they would report more words related to that task in a thought-listing experiment.

10.1. Method

This study was preregistered at https://aspredicted.org/blind.php?x=5YH_W8Y. We aimed to collect 600 participants. Six hundred eight adults from Amazon Mechanical Turk completed the study in exchange for payment ($M_{age} = 41.72$, $SD_{age} = 12.24$, 48% female). Participants read the same instructions as in Study 4a and were then assigned to either the continuous or intermixed condition with the same tasks (counting "e"s and rating comics). Participants did a "training session" (in which they rated both tasks) and began their "task session." Whereas in Study 4a participants were given an opportunity to switch on their 6th round of the task session, in Study 4b at this same point they completed a thought-listing task following the approach of Woolley and Sharif (2022). Specifically, participants read "In the spaces below, please write down the first 6 words that come to mind." After writing six words, participants advanced to the next page where they were shown each of the six words they had written on the previous page and asked to self-code whether each word was related to the counting task or not. Words that were self-coded as related to the counting task were coded as "1" and words that were not related were coded as 0. Our measure of accessibility was the sum of the words related to the counting task.

10.2. Results and discussion

As predicted, among participants who preferred rating comics ($n = 506$), participants in the continuous condition self-coded significantly more words as related to the counting task ($M = 3.28$) compared to those in the intermixed condition ($M = 2.56$), $b = 0.72$, $t(504) = 3.60$, $p < .001$, $d = 0.32$. These results suggest that the tedious task was more accessible for participants who did the tedious task continuously than participants who did the tedious task intermixed with another task. The results of Studies 4a and 4b together support our theory that doing a task continuously heightens tedious task-set accessibility (i.e., entrenchment) and thus increases the likelihood of bypassing the opportunity to switch to a preferred alternative (see Fig. 3).

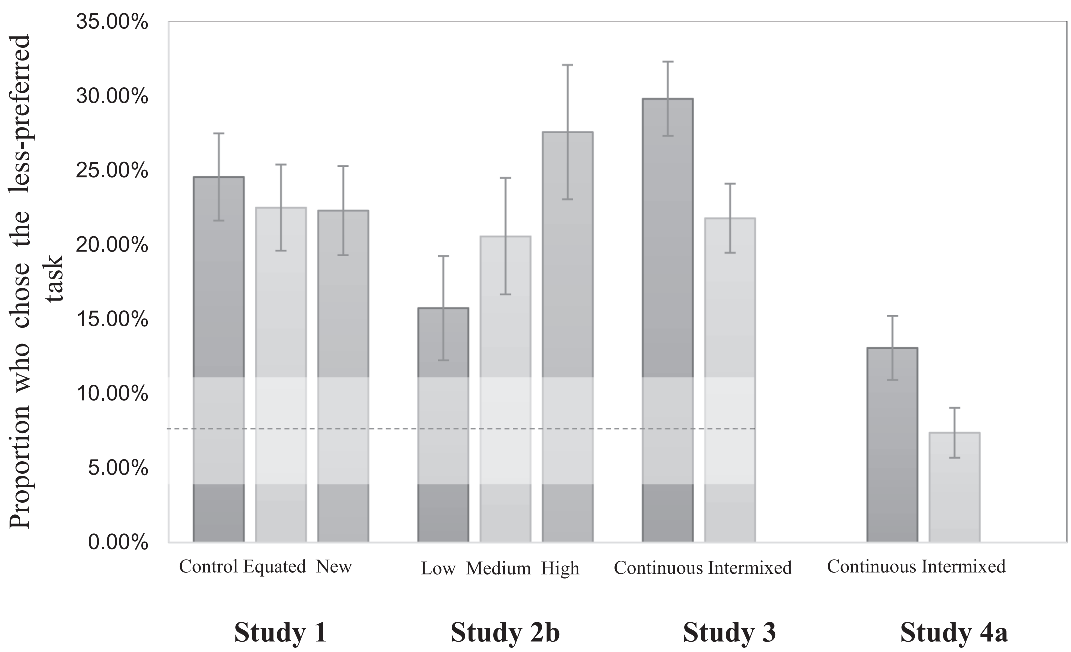

Fig. 3. Proportion of participants who stayed with their less-preferred task when given an opportunity to switch, Studies 1, 2b, 3, and 4a. Error bars represent SEM. Dotted line represents the pretested benchmark of 7.41%. Shading around the dotted line represents SEM.

11. General discussion

Daily life is riddled with behavioral ruts—people continuing less-preferred behaviors when they could easily switch to preferred alternatives that achieve the same (or better) outcomes. Such maladaptive behavior occurs across myriad contexts, including—but certainly not limited to—the workplace, health-related behaviors, transportation, and leisure activities. For example, envision an individual running late to a meeting a few blocks away. On her way, she passes a metro station but chooses to continue walking, as it feels easier than mentally reconfiguring and taking the metro (even when the metro would have been a more enjoyable experience). A similar example may happen when passing the time doing an unenjoyable task, such as endlessly scrolling on social media, rather than going outside and taking a walk on a pleasant day. Finally, consider an individual shopping on amazon. As she scrolls, entrenched in her search, a pop-up box appears asking her whether she'd like to switch to Amazon Smile—a choice which only requires one click and would result in a portion of her purchase being donated to charity. Yet, every time the button appears, she clicks to close the pop-up box and forgoes the opportunity. Finally, consider the ubiquitous and frequent scenario where an individual struggles to do daily tasks on their phone—email, work, shop, read, browse, check social media—that could be done more easily on a computer simply because the act of switching feels hard. Each of these provide an example of the behavioral ruts we examine in this research: situations in which people repeatedly or continuously do a less-preferred behavior as a means to an end and choose to continue that behavior even when presented with a preferred alternative. While such behavioral ruts are multiply determined, this paper explores a new mechanism that contributes to these seemingly odd behaviors: entrenchment—the increased accessibility of a task set which strengthens with repetition and continuity and makes constructing an alternative task set feel difficult, leading people to forgo opportunities to make beneficial changes.

Across multiple experiments, a significant subset of participants continued a less-preferred task when given a nearly costless opportunity to switch to a preferred alternative (Studies 1-4a). The more participants repeated the task, the more difficult they felt switching would be and the less likely they were to do so (Studies 2a-2b). However, disrupting task continuity decreased entrenchment (i.e., tedious task-set accessibility) and increased the proportion who switched (Studies 3, 4a-4b, and S1). These results support our assertion that people may at times continue less-preferred tasks because the task set is highly accessible—in other words, they are entrenched. Entrenchment deepens via task repetition and continuity. Individuals use the ease with which the activated task set comes to mind as information, making them feel as if constructing an alternative task set would be difficult, leading them to forgo opportunities for improvement. We find this effect repeatedly, even with our conservative design in which participants must actively attend to the choice options—as they are required to choose whether to switch or stay—which draws attention away from the focal task, likely disrupting entrenchment and reducing the proportion of people who may otherwise have chosen to continue their less-preferred task. Indeed, because in daily life people are often not prompted to consider switching when in a behavioral rut, we expect the phenomenon to be even larger than in our studies.

Importantly, in order to isolate the role of entrenchment, we designed our studies to control for alternative explanations documented in prior research. Specifically, because participants had virtually nothing to lose by switching, and the minimal effort to switch (press of a button) was equated (Studies 1, 2b, 3, 4a), loss aversion or transaction costs (Kahneman, Knetch, & Thaler, 1991), and behavioral friction (Mazar et al., 2021; 2022) are unlikely to have played a significant role. The same is true of anticipated regret (Zeelenberg & Beattie, 2006) or sunk costs (Arkes & Blumer, 1985), as participants tested all tasks beforehand (and thus were familiar with the alternatives) and completed the same number of rounds for the same amount of pay, no matter their choice. Further, participants were assigned to the initial task, they did not previously bypass it, making it unlikely that inaction inertia (Arkes, Kung, & Hutsel, 2002; Tykocinski, Pittman, & Tuttle, 1995), commitment (Cialdini, 2007), or cognitive dissonance (Festinger, 1957; 1964) drove their behavior. Further, as participants had to attend to the switch opportunity and had to take an action before they could proceed, motivated attention (Suri & Gross, 2015), participant inertia, action readiness, and defaults (Madrian & Shea, 2001; Suri, Sheppes, & Gross, 2015) seem improbable as explanations of the behavior. Finally, participants chose to continue the less-preferred—but highly accessible—task even when the text changed (Study 1), and the number of task rounds was uncertain (Studies 2a-4a), supporting our entrenchment account and reducing the likelihood of goal completion considerations (Förster, Liberman, & Friedman, 2007; Kivetz, Urminsky, & Zheng, 2006). Of course, in daily life, behaviors are almost always multiply determined and there are likely other factors that, along with entrenchment, contribute to failures to switch. Moreover, in such instances, it is likely that multiple behavioral influences may work together to increase the likelihood of behavior-change failures. Thus, in this research we investigate an *additional* mechanism that likely contributes to behavior-change failures; while beyond the scope of this research, common behavioral ruts are likely driven by multiple causes and may be even more probable in scenarios when more than one factor is at play (e.g., entrenchment in an already habitual behavior).

11.1. Theoretical contributions

This research makes several theoretical contributions to the management as well as the social and cognitive psychology literature by demonstrating that findings from the learning and expertise literature may be broader than previously realized. After learning how to solve a problem or becoming an expert in a given area (both of which take time and repetition), a previously learned approach is often the first to come to mind and thus may be used in place of better alternatives (Luchins, 1942; Marchant et al., 1991). The scenarios we investigate do not involve elements of learning or expertise as operationalized in past research—our scenarios did not involve problem-solving (participants neither learned solutions nor solved problems) and our participants were not and did not become domain experts. Yet, we find that the more participants perform a task, the more likely they are to choose to continue doing it—even at the expense of preferred alternatives. In this way, the cognitive tendency to persist with known approaches—and forego alternatives—may apply more broadly than previously realized.

Second, this research contributes to the decision-making literature. We present a novel account of, and explanation for, situations in which people fail to make decisions that are in their best interest (Bettman, Luce, & Payne, 1998). Much research has attributed scenarios in which people stick with suboptimal choices to status-quo bias (Samuelson & Zeckhauser, 1988), default effects (Madrian & Shea, 2001; Suri, Sheppes, & Gross, 2015), or inaction inertia (Tykocinski, Pittman, & Tuttle, 1995). We, however, designed our studies such that these factors would not be likely to have a significant impact on decisions as participants had to actively choose whether to stay or switch, and had not previously bypassed any switch opportunities. Entrenchment may thus be an additional contributing driver to passive failures to change that have been previously attributed to other underlying factors.

Additionally, we contribute to the research on goal pursuit. A large body of work examines when and how people can increase goal persistence. Reaching long-term goals, such as being healthier, saving money, or learning a new skill, often requires a great deal of self-control. As such, researchers have examined how to make persistence more likely via a multitude of interventions such as rewards, attentional interventions, and goal setting. For instance, Sharif & Woolley (2022) found that a work-to-unlock reward structure in which individuals must complete a specific number of goal-related tasks before receiving a reward increased persistence relative to a continuous reward structure.

Other work has found that motivation and persistence is increased by setting goals (Locke & Latham, 1990), how close one is to the completion of a goal (Kivetz, Urminsky, & Zheng, 2006), matching attentional demands to available resources (Lieberman, Morales, & Amir, 2021), and not focusing on the instrumentality of the activity (i.e., what it achieves; Fishbach & Choi, 2012). Our research contributes to this broader literature in two ways. First, we provide a new explanation for situations in which people may choose suboptimal methods during goal pursuit. Second, we contribute to the goal literature in that we identify a mechanism to increase persistence that, if encouraged in the right settings, may help people stick with a behavior that is unpleasant in the short-term but leads to long-term benefits (e.g., exercise).

Fourth, our work contributes to research examining how mindsets can impact behaviors and decisions (Dhar, Huber, & Khan, 2007; Malkoc, Zauberman, & Bettman, 2010; Moreau & Engeset, 2016; Xu & Schwarz, 2017). The notion of mindsets most relevant to this research characterizes them as procedures that, once activated for one goal, can affect subsequent unrelated goals (Wyer & Xu, 2010; Xu & Schwarz, 2017). Much of this research uses the term mindset to describe a behavior (as opposed to a theory). As such, the current work provides empirical evidence for a theory that may help explain the mechanism underlying mindsets. In addition, while the previous work has focused mostly on examining how activated procedures can affect behaviors in subsequent unrelated contexts, the current work investigates scenarios in which the accessibility of a task can affect decisions about that same task.

Finally, entrenchment may inform the literature on flow and immersion. A great deal of research has investigated absorption in *enjoyable* activities or positive experiences (Csikszentmihalyi, 1990; Jennett et al., 2008). When people are in a state of flow or immersed in a fun activity, they are intensely focused on the task at hand, often losing awareness of internal and external factors (e.g., the passage of time, hunger; Brown & Cairns, 2004; Csikszentmihalyi, 1990; Jennett et al., 2008; Kubey & Csikszentmihalyi, 2002). Although in this research we study less-preferred behaviors (which could not lead to flow or immersion as both constructs require special circumstances, such as positive experience and balance of challenge and skill; Brown & Cairns, 2004; Csikszentmihalyi, 1990), the underlying psychology may be similar. That is, entrenchment—increased accessibility of task procedures—may be a contributing mechanism to both flow and immersion. Entrenchment may thus help explain why individuals continue not only negative, but also positive and neutral behaviors.

11.2. Managerial implications

Our results have important managerial implications. First, organizations could use these results to improve employee productivity. For example, the workday is often filled with entrenching tasks that may prevent employees from considering preferred alternatives. For instance, once beginning a task, such as manually entering data into a spreadsheet, employees may become entrenched and fail to recognize other approaches that might be preferable. Thus, for certain tasks, managers could institute required breaks or have employees alternate between tasks, thereby decreasing entrenchment and increasing the likelihood they consider alternative approaches. On the other hand, for some tasks, entrenchment may be beneficial. For tedious tasks that require persistence, such as proofreading or transcribing, managers may wish to encourage environments that *increase* entrenchment (e.g., reducing distractions) to motivate employees to persist in the task and not switch to alternative activities. Finally, employers could install software on employee computers that requires employees to complete an unrelated task (e.g., captchas) when spending too much time on non-work websites—such as social media—breaking entrenchment and increasing the likelihood they switch back to work tasks. Such an intervention would reduce paternalism (compared to blocking such websites, for instance) in the workplace while also preventing employees from becoming entrenched in websites unrelated to work.

Second, our results suggest that attention should be paid to advertisements that occur during entrenching activities. For instance, marketing managers may choose to place ads early on during entrenching activities before entrenchment sets in (e.g., a spot in the first commercial break of an immersive show, or a clickable ad near the beginning of an online article). Corroborating this, previous research finds that people tend to be more responsive to advertisements that are shown earlier in a viewing session, before they become deeply engaged (Schweidel & Moe, 2016). Entrenchment not only provides empirical support for this notion, but also provides a mechanism that may explain why it occurs.

Further, managers of retail outlets are increasingly interested in understanding how layouts and in-store shopping behaviors affect purchase likelihood (e.g., Hui et al. 2013; Walter et al. 2020). For instance, the longer customers spend in a store, the more purposeful they become—that is, they are less likely to explore and more likely to purchase (Hui, Bradlow, & Fader, 2009). Our results contribute a novel explanation for these findings, with implications for the management of stores. As an example, designing a store that encourages focused shopping (e.g., aisles or in-store prompts designed to increase focus on the task at hand) may increase shopping persistence and planned purchases. Marketplaces could also be designed so that switch opportunities that are desirable to stores feel less effortful to shoppers. For instance, placing grocery carts throughout a store or having employees bring carts to customers carrying products by hand could help counter the tendency of entrenched customers to forego a cart, potentially increasing time spent shopping and boosting sales.

More generally, our results speak to the importance of instituting interventions early on during a task or a behavior, if change is desired, as changing behaviors once individuals are entrenched in a behavioral rut is more difficult. For instance, interventions to decrease detrimental bingeing behaviors—watching a TV show past the point of enjoyment or even binge-eating, may be more effective if they are implemented early on during a binge—stopping it before it picks up steam. These findings should be considered when designing interventions aiming to change behavior.

11.3. Directions for future research

Our findings suggest a variety of directions for future research. First, while our experiments focused on the participants who failed to switch, many participants successfully switched. Future research may examine which individual traits increase or decrease one's likelihood of becoming entrenched, as well as the ability to overcome entrenchment. For instance, individuals' need for cognition may affect their task persistence even when continuing the task is detrimental (Steinhart & Wyer, 2009). Traits that correlate with an individual's flexibility (e.g., ruminative coping style, obsessive-compulsivity; Davis & Nolen-Hoeksema, 2000; Gu et al., 2007) may also correlate with the tendency to become entrenched. And, if so, interventions aimed at increasing flexibility may also decrease entrenchment. People who fall prey to entrenchment may also be more likely to display maladaptive persistence in other areas of their life—these individuals may be more likely to develop poor habits, for example (Wood, 2017). More generally, investigating what increases a person's tendency to become entrenched, and traits that help people overcome the pull of entrenchment, could be a productive area for future research.

Relatedly, future research may explore situations in which entrenchment is not likely to occur. Our theory suggests repeating a less-preferred behavior continuously increases accessibility of the task set, leading people to bypass opportunities to switch to preferred alternatives. Future research might examine whether there are some behaviors that, no matter how much they are continuously repeated, do not become more accessible—such as very complex or painful behaviors. Similarly, it is possible that certain contexts might prevent entrenchment—for instance, we found that dividing attention attenuated entrenchment; as such, would someone be less likely to get entrenched if performing a task in a location where distraction is likely, such as a noisy coffee shop? Finally, it would be worthwhile to investigate what external factors might help people overcome entrenchment—for example, can financial incentives (and at what amount) outweigh the pull of entrenchment?

Another direction may be to investigate the role of entrenchment when people are given multiple opportunities to choose whether to switch or to stay. Our studies were designed to isolate the effects of entrenchment and thus we examined participants' choice on the first opportunity to switch. In daily life, however, there may be multiple opportunities to decide whether to change paths. Some previous research suggests that after making an initial decision or bypassing an initial opportunity to switch, people will be even less likely to switch in subsequent opportunities (Murray & Häubl, 2007; Tykocinski, Pittman, & Tuttle, 1995; Zauberman, 2003). On the other hand, research has shown that for behaviors that individuals are trying to control, partitions can draw attention to the decision, providing them with more decision-making opportunities and helping them exhibit self-control (Cheema & Soman, 2008). In this way, multiple opportunities might increase the likelihood that people consider the benefits of switching. Future research may investigate whether and how entrenchment affects decisions when given more than one opportunity to make a change.

A related question is how behavioral tracking may affect entrenchment, as individuals increasingly use tracking technologies to monitor their behavior. On the one hand, it is possible that tracking one's performance could divide one's attention (i.e., disrupt task continuity), thereby attenuating entrenchment and increasing switching. On the other hand, tracking could work alongside entrenchment and further contribute to switch failures. Specifically, measuring output has been shown to increase how much of a behavior people do (Etkin, 2016) and highlighting streaks (vs. broken streaks) in behavioral logs can increase subsequent engagement in that behavior (Silverman & Barasch, 2023). Thus, increasing awareness of the number of tedious task rounds one completes—especially if framed as a streak—could further increase the likelihood people bypass opportunities to switch. Future research could examine the interplay between behavioral tracking, entrenchment, and switching behaviors.

Future research may test additional ways to decrease or prevent entrenchment. Given the ubiquity of behavioral ruts and the toll they take on well-being, uncovering additional methods to attenuate entrenchment is important. We demonstrated that reduced repetition, dividing attention, and intermixing tasks decreased the likelihood of entrenchment and its negative consequences. Future research could investigate other interventions to further reduce, or even eliminate, entrenchment. Relatedly, additional exploration of the types of interruptions or breaks that attenuate entrenchment could be useful. In this research we found that disrupting continuity by intermixing tasks or dividing attention reduced entrenchment. Future research may examine other forms of interruptions and their effect on entrenchment. For instance, how does changing one's physical environment (e.g., going in a different room, or going for a walk) or having a conversation with someone unrelated to the task affect entrenchment and subsequent switching decisions? Similarly, future research may further investigate whether entrenchment affects behavior differently when people are switching methods to complete a single goal versus switching to a new goal entirely. Our studies focused on the former. Theoretically, however, entrenchment may not only cause people to fail to switch methods to complete an activity (e.g., switching from one's phone to a computer, switching from a tedious task to a preferred one to complete a survey) but also fail to switch tasks altogether (e.g., stopping a tedious work task to go outside and take a walk). Future research may thus wish to investigate whether entrenchment impacts people differently when switching from one task to something completely unrelated.

Future research might also explore the relationship between entrenchment and exploration and variety-seeking. The variety seeking and exploration literature often examines scenarios in which, after repeated engagement, individuals switch away from liked or enjoyable experiences (Ratner, Kahn, & Kahneman, 1999). In contrast, the current research examines why, after repeated engagement, people do not switch away from unenjoyable experiences. Variety seeking and exploration have been attributed to several causes, including a desire to maintain an optimal stimulation level (Steenkamp & Baumgartner, 1992) or reaching satiation (i.e., decreased utility; McAlister, 1982). Entrenchment may suggest an additional reason why people behave consistently—*not* seeking alternatives—and could suggest an intervention to decrease variety-seeking (when that is the goal). Moreover, it is possible that entrenchment may counter variety-seeking tendencies—perhaps by preventing satiation—and increase consistency. Future research may examine the relationship between entrenchment, satiation, and stimulation, and how this impacts people's exploration tendencies.

Finally, we designed our experiments to isolate the effect of entrenchment on switching behavior and thus limit the impact of other factors such as status quo or default effects (as participants had to actively make a choice whether to switch or stay and could not simply do nothing to continue). However, many of these well-known effects are attributed to multiple drivers and entrenchment, as a mechanism, may further contribute to the emergence of these and other related phenomena. Thus, a fruitful area for research would be to investigate how entrenchment relates to these and other important situations where individuals fail to make beneficial changes.

In conclusion, behavioral ruts have important implications for managers, individuals, and society. This research offers new insights into why people continue less-preferred behaviors and proposes a novel mechanism that may shed light on other well-known phenomena in which individuals needlessly stick with suboptimal choices. Further, we show that entrenchment, and its associated consequences, can be attenuated and uncover several methods to overcome the difficulties of behavior change. Both managers and individuals would do well to consider the hidden pull of entrenchment and how to prevent getting stuck in ruts.

CRediT authorship contribution statement

Alicea Lieberman: Conceptualization, Methodology, Data curation, Formal analysis, Investigation, Project administration, Writing – original draft, Writing – review & editing. **On Amir:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Supervision. **Ziv Carmon:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

All data is available at this link: https://osf.io/wr3ac/?view_only=9863ddc2f2c14a5a8bc160c119033588.

Acknowledgement

The authors thank the editor, associate editor, and reviewers for their thoughtful and insightful input. The authors are also grateful to Jonathan Levav, Juliana Schroeder, Piotr Winkielman, Wendy Wood, Kristen Duke, and Anne Wilson for their support and helpful comments on earlier versions of this research, and Tiss Doci and the Atkinson Behavioral Lab for data collection assistance.

Funding

The authors thank the Morrison Center for Marketing and Data Analytics at the UCLA Anderson School of Management for providing research funding.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.obhdp.2023.104277.

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