Multitasking as Consumer Compensatory Control

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ABSTRACT

Consumer multitasking (i.e., working on multiple tasks simultaneously) is a widespread modern phenomenon, yet the literature lacks an understanding of when and why consumers multitask. We experimentally show that consumers engage in multitasking behavior as a way to compensate for feelings of low control. Specifically, across five main studies and seven Web Appendix studies using two different multitasking paradigms, we find that consumers feeling low (vs. high) control volitionally choose to multitask more on subsequent tasks, rather than do the tasks sequentially (i.e., one task at a time). Mediation and moderation evidence demonstrate that this effect is driven by increased motivations to use time resources efficiently for those feeling low (vs. high) control. We also find that multitasking generally results in suboptimal consumer decision making and decreased task performance. An intervention that altered consumer lay beliefs regarding multitasking and time efficiency was effective in lowering multitasking behavior for consumers experiencing low control during the COVID-19 pandemic. By investigating a cause of consumer multitasking and the underlying mechanism, our studies contribute to research on consumer multitasking, perceptions of control, and resource allocation with important implications for advertisers and marketing managers.

Keywords: multitasking, perceived control, compensatory control, resource allocation, time efficiency

INTRODUCTION

The development and ubiquity of portable digital devices have resulted in an environment where consumers are constantly multitasking. For example, a consumer might be watching a TV sitcom while simultaneously shopping for products online on her laptop computer. Indeed, surveys have found that 99% of adults in the United States have multitasked while watching television (TiVo Research Group 2015) and that the majority of online shoppers are also multitasking (Hagai 2018). Moreover, many smartphones and tablets (e.g., iPads) let users run multiple apps at once by splitting the screen, and new laptops feature dual screens that enable consumers to watch content or ads on YouTube while simultaneously focusing on a different app (e.g., a consumer review website). Because of the prevalence of multitasking and its potential to affect how consumers process information and make decisions (Bolls and Muehling 2008), consumer multitasking is an important and pertinent topic for consumer researchers and marketers alike. Despite such importance, the literature knows surprisingly little about when and why consumers are likely to multitask. We investigate this question.

Consumer multitasking, defined as "the act of rapidly switching from one task to another or juggling multiple tasks at the same time" (Duff et al. 2014; Ie et al. 2012), is related to the constructs of distraction (Nelson, Duncan, and Kiecker 1993; Wright 1974) and cognitive load (Drolet and Luce 2004; Shiv and Huber 2000; Ward and Mann 2000) in that it involves a dispersion of attention or a decrease in the amount of cognitive resources available for multiple tasks. However, a key distinction between multitasking and these prior constructs is that multitasking is a *volitional* behavior in which consumers themselves choose to engage in multiple tasks simultaneously. In other words, if a consumer is multitasking, she is doing so even

though she had the option of doing each task separately (i.e., sequential-task).

Because this volitional aspect is a hallmark of multitasking behavior, understanding when and why consumers choose to multitask is important. However, this voluntary side of multitasking has received little attention in the literature. Prior research on multitasking often has used a forced task switching paradigm, where the experiment itself dictated when task switching would occur and what task participants would work on at each time (e.g. Bolls and Muehling 2008; Rubinstein, Meyer, and Evans 2001). In addition, the minimal research on antecedents of multitasking has been limited to looking at demographic factors (e.g., age: Jeong and Fishbein 2007; gender: Duff et al. 2014) or individual differences (e.g., sensation seeking: Jeong and Fishbein 2007; need for simplicity: Duff et al. 2014) rather than situational or incidental factors. Further, this line of work has relied almost exclusively on surveys and correlational research methods, increasing the difficulty of drawing conclusions about causal directions.

The current paper aims to address these gaps in the literature by identifying a widely studied consumer variable, perceived control, as an antecedent to multitasking behavior. Specifically, we propose and find that incidental feelings of low control increase consumers' tendency to multitask on subsequent tasks. Notably, we find evidence that multitasking happens because people see it as a way to reestablish control by using their time resources efficiently. By showing that feelings of low control lead to more multitasking behavior, we add to the literature on consumer multitasking and perceived control. Moreover, we identify important implications of our findings for marketing managers and policy makers.

In the following sections, we first delineate the construct of multitasking and its relationship to existing consumer research topics. We then introduce previous work showing that consumers believe multitasking helps them to use their time more efficiently. Next, we review

the compensatory control literature and discuss prior research showing that consumers who feel low control become motivated to use their resources more efficiently. Building on these findings, we hypothesize that feelings of low control lead to increased multitasking, due to greater motivations to use time resources efficiently as a form of compensatory control. We present the results of five main studies and seven Web Appendix studies to support our predictions.

THEORETICAL BACKGROUND

Consumer Multitasking

Multitasking involves frequent switching from one task to another in the same time period in an effort to perform both tasks concurrently (Duff et al. 2014; Konig, Buhner, and Murling 2005; Redick et al. 2016). This conceptualization of multitasking is adopted from cognitive psychology and communications research, which specifies task independence (i.e., self-containment of each task) and concurrency of tasks (i.e., temporal overlap) as two necessary components of multitasking (Adler and Benbunan-Fich 2012; Benbunan-Fich, Adler, and Mavlanova 2011). Relatedly, prior research (Pashler 1994) shows that even though individuals might feel like they are simultaneously accomplishing multiple tasks at once, such beliefs are false; in reality, they are engaging in rapid task switching. This rapid task switching, resulting from multitasking, leads to a dispersion of attention (Ophir, Nass, and Wagner 2009) across multiple stimuli and a decrease in the amount of cognitive resources available for a focal task (Rubinstein et al. 2001). Such characteristics make multitasking research relevant to previous work on distraction (Wright 1974; Zane, Smith, and Reczek 2020) and cognitive load (Shiv and Fedorikhin 1999) in the consumer decision making literature. For instance, MacInnis and

Jaworski (1989) stated that distraction "implies a lack of attention [to the focal task] and hence greater capacity allocated to the secondary task" (pg. 7). In addition, a common method used to manipulate cognitive load is to have participants memorize a string of words or numbers while performing a focal task (Shiv and Fedorikhin 1999), which essentially asks people to engage in two tasks: a focal task and a secondary memory task. However, we see two paramount distinctions between these prior consumer constructs and multitasking. First, the literature on distraction and cognitive load typically has a primary focal task and a peripheral task, whereas in multitasking, both tasks may be equally important. Second, and importantly, distraction and cognitive load are non-volitional consequences in response to people's interaction with incidental environmental factors, whereas multitasking is a result of people's volitional choice about how to do things. Put differently, the literature on distraction and cognitive load helps us to gain an understanding of what might happen while people are multitasking, but it provides little guidance as to when and why people might choose to multitask rather than sequential-task.

Germane to our paper, preliminary work suggests that people multitask because they think it will help them use their time more efficiently (Adler and Benbunan-Fich 2013; Bardhi, Rohm, and Sultan 2010; Reinsch, Turner, and Tinsley 2008; Wang and Tchernev 2012). Using in-depth interviews, Bardhi et al. (2010) found that consumers believe multitasking enables them to become more efficient because they believe they can get things done and process content in less time. Also, Reinsch et al. (2008) argued that multi-communicating (i.e., a form of multitasking in the realm of communication) is "motivated by a desire to use time (chronos) efficiently" (pg. 400). In the consumer domain, multitasking products have been described as products that help users become efficient by saving time (Keinan and Kivetz 2011). In our paper, we adopt the definition of efficiency from the multitasking and consumer literatures as

minimizing the time spent to complete the same amount of tasks (Fernbach, Kan, and Lynch 2015; Johnson, Bardhi, and Dunn 2008; Keinan and Kivetz 2011; Mick and Fournier 1998; Murray and Häubl 2007).

We conducted a pilot test (N = 104, 50 females, mean age = 32.57) on Amazon mturk to confirm that people believe multitasking helps them use their time more efficiently. Participants were asked to indicate their agreement (1 = Completely disagree, 7 = Completely agree) with statements regarding multitasking and time efficiency ("Multitasking lets people become more efficient"; "Multitasking lets people minimize the amount of time spent completing tasks"; "Multitasking helps people not waste time"; $\alpha = 0.92$). Consistent with past work, respondents indeed believed that multitasking helps them use time more efficiently (M = 4.90, difference from mid-point 4: $t(103) = 5.85$, $p < .0001$).

This lay belief about multitasking and time efficiency benefits is important because prior work on consumer compensatory control (Fiske, Morling, and Stevens 1996; Landau, Kay, and Whitson 2015) suggests that people feeling low control might have increased motivations to use their resources, such as time or money, more efficiently (Durante and Laran 2016; Fernbach, Kan, and Lynch, Jr. 2015). In the next section, we briefly discuss research on compensatory control and explicate why consumers feeling low control might find multitasking appealing.

Consumer Multitasking as Compensatory Control

Consumers' perceived control, which refers to their perceived ability to attain wanted outcomes (Skinner 1995), can fluctuate throughout their daily lives (Cutright 2012; Whitson and Galinsky 2008), due to incidental factors, such as remembering a time of low control (Whitson and Galinsky 2008), being deprived of choice options (Inesi et al. 2011), or even reading articles

that discuss how people have low control in their lives (Cutright and Samper 2014). Importantly, prior research shows that consumer experiences of low control can affect their subsequent decision making in ways that might have nothing to do with the initial experience (Chen, Lee, and Yap 2016; Cutright and Samper 2014; Whitson and Galinsky 2008).

Past work on compensatory control mechanisms (Kay et al. 2009) argues that, because the belief that one has control in life is so important, people become motivated to reestablish feelings of control after experiencing events that make them feel that they lack control (Fiske et al. 1996). Such motivations lead to preference shifts and behavioral changes that help people regain feelings of control (Cutright 2012; Durante and Laran 2016; Whitson and Galinsky 2008). For instance, consumers feeling low control become more focused on solving problems in their lives (to feel that they indeed can attain desired outcomes) and thus prefer utilitarian products over hedonic ones (Chen et al. 2016). Relatedly, Cutright and Samper (2014) find that consumers who feel low control prefer high effort products as a way to feel empowered and thus capable of achieving their desired outcomes.

In the context of our research, the literature suggests that consumers feeling low control might become motivated to use their resources more efficiently to restore feelings of control (Durante and Laran 2016; Fernbach et al. 2015). Consumer resources, such as time and money, are defined as things that help consumers get wanted outcomes in their lives (Dorsch, Tornblom, and Kazemi 2017; Halbesleben et al. 2014). Given that perceived control refers to one's perceived ability to attain wanted outcomes (Skinner 1995), consumers' perceived control is inextricably linked to the availability of resources. Indeed, prior work finds that having ample resources helps people feel high control in life, whereas lacking resources makes them feel low control (Johnson and Krueger 2006). Therefore, using resources efficiently when solving

problems should help consumers feel a heightened sense of control by letting them get things done (Chen et al. 2016), allowing them to have more resources to use for future tasks (Durante and Laran 2016), and letting them affirm the belief that they are capable and efficacious (Bandura 1982). Finally, being efficient by using less resources to achieve desired outcomes often involves putting in more effort (e.g., applying oneself more to a task; Fernbach et al. 2015), which has been found to lead to higher feelings of control (Cutright and Samper 2014).

Supporting such a view, Fernbach et al. (2015) found that when consumers experience resource constraints, and are thus likely feeling low control, they commonly engage in efficiency planning, seeking to stretch their limited resource to attain the same outcome. For instance, consumers might visit multiple stores in a single trip to stretch their time resources. Of particular note, the authors also found that efficiency planning facilitates a sense of accomplishment (i.e., feeling like one is accomplishing something) and decreases feelings of giving something up, both of which have direct implications for greater feelings of control.

In short, building on the literature on compensatory control and consumer multitasking, we predict that consumers feeling low (vs. high) control will engage in more multitasking behavior. Moreover, we posit that this increased tendency to engage in multitasking will be driven by increased motivations to use time resources efficiently. Put formally, we hypothesize:

H1: Incidental feelings of low (vs. high) control will increase people's tendencies to multitask.

H2: Motivations to use time efficiently mediate the relationship between consumer perceived control and tendencies to multitask.

OVERVIEW OF STUDIES

We conducted five studies that used multiple control manipulations, multitasking contexts, and consumer decision tasks to fully investigate our theory and predictions. In Study 1, we gained preliminary support for our proposed effects by testing whether incidentally feeling low (vs. high or baseline) control makes people want to multitask more. In Study 2, we extended our focus to the entire chain of events to document the effects of consumers' perceptions of control on their choice to multitask and to further examine the downstream consequences on task performance. For Studies 3, 4, and 5, we used a web-app experimental paradigm to further test the robustness of our proposed effects and to measure actual task switching behavior when participants were given two different tasks. We also gained evidence that motivation to use time efficiently underlies the effect of perceived control on multitasking tendencies and ruled out alternative explanations, including sensation-seeking, boredom, and performance motivation.

Although our central focus is on the relationship between consumers' perceived control and multitasking behavior, we also document how multitasking influences downstream consumer decision making and task performance for completeness (Studies 2, 3, and 4) and provide a summary of our results in the General Discussion. A recent review of more than 20 media multitasking studies concluded that heavy multitaskers generally performed worse than light multitaskers on a range of cognitive tasks, although some studies reported null effects (Uncapher and Wagner 2018). Prior research has attributed such decreased performance to people having limited attention capacities (Kahneman 1973) and the cognitive costs involved in switching between tasks (Rogers and Monsell 1995; Rubinstein et al. 2001). Consistent with the balance of prior work, we expect that multitasking leads to overall decreased consumer task

performance (Uncapher and Wagner 2018).

We note that all of our studies incentivized performance by providing lottery prizes (i.e., cash or a chance to win chosen products during tasks) to participants who did well on the main tasks (details in our Web Appendices) to ensure all participants had sufficient motivation. We also included an attention check (Oppenheimer, Meyvis, and Davidenko 2009) in all of our studies that said, "If you have carefully read this question, do not answer the question and please go on to the next page." Participants who clicked on any response were excluded from the analyses.

STUDY 1: HOW INCIDENTAL CONTROL AFFECTS PREFERENCE TO MULTITASK

Study 1 aimed to obtain initial support for our hypotheses by manipulating perceived control and looking at its effect on people's preference to multitask (H1). We also sought evidence for the compensatory nature of low control by comparing it to a baseline condition and a high control condition. If a compensatory control mechanism is responsible for the proposed effect, we would expect participants in the low perceived control condition to show increased preference for multitasking, compared to those in the high control condition and those in a baseline control condition (Chen et al. 2016; Cutright 2012). We note that participants in Study 1 did not engage in the actual tasks because the focus of our study was on the antecedent process that drives people's tendency to multitask.

Method

Participants and design. One hundred and eighteen university students (71 females, mean age = 19.97) participated in Study 1 for partial course credit. Seven participants who failed the attention check were excluded. The study had three between-subjects conditions (High Control vs. Low Control vs. Baseline).

Procedure. The study was composed of two parts: The first part manipulated incidental control and the second part asked participants about their preferences for multitasking. All manipulations, instructions, and measures are included in Web Appendix 1.

Incidental control was manipulated using a recall task (Whitson and Galinsky 2008), where participants were given two minutes to think and write about a time when they felt either high or low control. Participants were then asked to describe the situation and write about how they felt at that moment. For the baseline condition, participants were asked to think about the last book or magazine they had read and write about the experience (adapted from Cutright 2012). After participants finished the writing task, we asked them how much control they felt during the situation as a manipulation check (1: Very little; 7: Very much).

Next, participants were told that they would be participating in two additional studies: one involving a *Consumer Reports* article reading task and one involving a video viewing task. To incentivize motivation, they were also told that participants who score in the upper 50% on the tasks would have a chance to win a $5 gift card. The instructions explained that if they chose to complete the tasks sequentially, they would start with one task and not begin the second task until they were finished with the first one, and if they chose to complete the tasks simultaneously, they would complete the two tasks at the same time.

After reading the instructions, participants indicated their preference for completing the two tasks using a 7-point bipolar scale (1: "I will definitely do the two tasks sequentially. That is,

do the tasks one by one."; 7: "I will definitely do the two tasks simultaneously. That is, do the tasks at the same time."; the order of these scale anchors was counterbalanced). Participants next answered several demographics questions and then were told that because the required number of participants for the tasks (i.e., the *Consumer Reports* reading task and the video viewing task) had already been reached, they did not have to actually complete the tasks.

Results

Manipulation Check. A one-way ANOVA on the control manipulation check item revealed that our control manipulation was successful, where participants in the low control condition reported having felt lower control than those in the high control condition ($M_{\text{LowControl}}$ = 2.15, SD = 1.09 vs. $M_{\text{HighControl}}$ = 6.02, SD = .94; F (1, 108) = 185, $p < .001$) and those in the baseline control condition (vs. M_{Baseline} = 4.77, SD = 1.61; F (1, 108) = 77.06, $p < .001$). We ran manipulation checks for subsequent studies and the results showed that the manipulation was successful in all cases. We report the other manipulation check results in Web Appendix 2.

Preference to Multitask. A one-way ANOVA revealed a marginal main effect of perceived control on participants' preference to multitask (F (2, 108) = 2.80, p = .065, η_p^2 = .05). More importantly, contrast analyses supported H1 showing that those in the low control condition ($M_{\text{LowControl}}$ = 3.09, SD = 2.42) had a significantly higher preference to multitask compared to those in the high control condition ($M_{\text{HighControl}}$ = 2.16, SD = 1.85; F (1, 108) = 4.42, p = .04) and those in the baseline condition (M_{Baseline} = 2.14, SD = 1.35; F (1, 108) = 4. 2, p = .04). The difference between the low control condition and the average of the high control and baseline conditions was also significant (F (1, 108) = 5.59, p = .02). These results provided support for a compensatory control mechanism, confirming that participants feeling low control

exhibited an increased tendency to multitask.

In sum, Study 1 provides preliminary evidence for our hypothesis that feelings of low control increase consumer tendencies to multitask, and a compensatory control mechanism underlies the effect. Additional analyses showed no effect of participant gender (see Web Appendix 1). One limitation of Study 1 is that the procedure did not specify the time allotted for each task to the participants. We therefore conducted a follow-up study (Study 1a in Web Appendix 3) using a 2 (Control: High vs. Low) cell between-subjects design and using the same control manipulation and dependent variable. One hundred and ninety-nine participants (97 female, mean age = 33.64) were told that they would have 8 minutes to complete the two tasks either sequentially or simultaneously. Supporting H1, a one-way ANOVA on participants' preference to multitask indicated that feelings of low (vs. high) control led to a greater preference to multitask ($M_{\text{LowControl}}$ = 2.92, SD = 2.39 vs. $M_{\text{HighControl}}$ = 2.23, SD = 1.89; F (1, 197) = 5.01, p = .03, η_p^2 = .02).

STUDY 2: HOW INCIDENTAL CONTROL AFFECTS CHOICE TO MULTITASK AND SUBSEQUENT PERFORMANCE

Having found initial evidence in support of H1 that low perceived control leads to greater multitasking likelihood, we next expanded our focus in Study 2 to see how feelings of control can influence people's actual choice to multitask and how this choice might in turn influence task performance. In addition, to rule out mood as an alternative explanation, we used a different control manipulation. Finally, we sought to rule out the alternative account that low perceived control lowered people's pre-task expectations of task performance and that this made

participants care less. Stimuli for Study 2 (i.e., measures, stimuli, task-related questions, and additional analyses) can be found in Web Appendix 5.

Method

Participants and design. One hundred and fifty-one students (89 females, mean age = 20.76) from a large university participated in the study for extra course credit. Ten participants who failed the attention check were excluded from our analysis. The study had a 2-cell (Control: High vs. Low) between-subjects design.

Procedure. To manipulate participants' incidental perceived control, we instructed participants to write about something positive that happened to them that was either "because of something that you did" (high control) or "NOT because of something that you did" (low control). This task has been used to manipulate control without differentially affecting general mood (Cutright 2012; Cutright and Samper 2014). After the control manipulation, participants were told that they would be completing two more tasks: a product choice task and a video viewing task. After participants chose to multitask or sequential-task and before they started the actual tasks, we asked participants how likely they thought they would perform in the upper 50% on the two tasks (1: "Very unlikely"; 7: "Very likely") and thus be eligible for the lottery prize. This served as a measure of pre-task expected performance.

Participants then went on to the next page to complete the two tasks either simultaneously or sequentially. Those who chose to work on the two tasks simultaneously (i.e., to multitask) saw a split screen, where the product choice task was on one side and the video task was on the other. In contrast, those who chose to do the tasks sequentially did the two tasks one at a time (order was randomized). Participants had four minutes each to complete the two tasks in the sequential

case and four minutes total for both tasks in the simultaneous case.

The product choice task was a principal-agent task, in which participants were instructed to select five office products (e.g., computer mouse, coffee machine) for their co-workers based on the product preferences of the group. Each product pair was constructed to test the effect of non-diagnostic attributes on consumer decision-making (Hutchinson and Alba 1991). Specifically, one option in the product pair was clearly a better fit for the office group's preferences; however, it had fewer overall attributes compared to the other option. For each of the product categories, participants were asked which product they thought their co-workers would prefer (1: "Definitely prefer option A"; 7: "Definitely prefer option B"). For the video task, participants viewed a short video documentary about identical twins and answered six comprehension questions at the end of the two tasks. Participants then answered a control manipulation check item and two post-task well-being items, which measured stress ("How much stress did you feel while completing the survey?" 1: "Very little"; 7: "A lot") and general affect using the 10-item short form PANAS (Thompson 2007).

Results

Choice to Multitask. In support of H1, participants in the low control condition were more likely to multitask compared to those in the high control condition ($\%_{LowControl} = 44.93$ vs. $\%_{HighControl} = 29.17$; χ^2 (1) = 3.76, $p = .05$, $\varphi = .16$; see fig. 1). Moreover, a two-way ANOVA further showed that the effects of perceived control, the choice to multitask, and the interaction effect had no significant effect on pre-task expected performance (all F's < 1, NS).

INSERT FIGURE 1 ABOUT HERE

Task Performance and Post-Task Well-Being. A one-way ANOVA showed that multitaskers performed worse on subsequent tasks ($M_{Multitask}$ = 6.15, SD = 1.58 vs. $M_{Sequential}$ = 8.45, SD = 1.67; F (1, 139) = 64.84, p < .0001). Mediation analysis using the binary_mediation package for STATA (Ender 2010) also revealed a significant indirect effect of control on overall performance through multitasking choice (95% bias-corrected CI: [.0046, .2246]), where low control led to increased multitasking choice, which in turn decreased overall performance. The well-being measures revealed that those who multitasked (vs. sequential-tasked) reported feeling more stress ($M_{Multitask}$ = 3.88, SD = 1.73 vs. $M_{Sequential}$ = 3.01, SD = 1.63; F (1, 139) = 8.96, p < .003) and negative affect ($M_{Multitask}$ = 1.63, SD = .65 vs. $M_{Sequential}$ = 1.33, SD = 0.41; F (1, 139) = 11.69, p < .001). We saw no difference in terms of reported positive affect (F = 1.57, NS).

In sum, Study 2 offered four insights. First, we found additional support for H1, where low perceived control led to increased multitasking. Second, supporting prior work (Uncapher and Wagner 2018), the results showed that multitasking impaired consumer decision making performance and well-being (also see Study 2a in Web Appendix 6, where we replicated the effect using a different screen layout and tasks). Third, the control manipulation task used in Study 2 helped to increase the robustness of our findings while also ruling out differential mood as an alternative explanation for our findings. Finally, perceived control had no effect on participants' pre-task expected performance, indicating that they underestimated the potentially harmful effect of multitasking on their actual performance. This result also casts doubt on the view that participants feeling low control chose to multitask because they felt that they would not be able to do well on the tasks.

MEASURING MULTITASKING VIA WEB-APP EXPERIMENTAL PARADIGM

Across our initial studies, we found evidence that perceptions of low control increase people's tendency to multitask. For these studies, we used an experimental paradigm in which we directly asked participants upfront whether they would multitask or not (i.e., upfront choice). This paradigm afforded us the advantage of establishing that people who perceive low control intentionally multitask, even when they are fully aware of it. An additional advantage is that the participants who chose to multitask had the opportunity to work on both tasks simultaneously.

However, this measure of multitasking behavior also has a few limitations. Specifically, this paradigm prevented us from measuring actual multitasking behavior during task completion and also locked participants into a certain condition which might have unduly inflated the negative effect of multitasking on task performance.

To address these limitations and to show the generalizability of our effects across various multitasking situations, we developed a web-app for measuring multitasking behavior. Based on prior research (Adler and Benbunan-Fich 2012, 2013; Payne, Duggan, and Neth 2007), the web-app split the screen into a left and right panel and displayed two separate tasks on each panel. The goal of this design was to make a closed environment in which participants could work on predefined tasks that require different sensory inputs and cognitive requirements, and could freely choose whether to multitask (i.e., engage in task switching).

Moreover, we aimed to cover the three different types of multitasking identified in the literature by using the two different experimental paradigms. Adler and Benbunan-Fich (2012) categorized multitasking into three types based on the amount of task overlap. First, in a *sequential strategy*, no overlap occurs between tasks, and therefore, it is not considered

multitasking and can serve as a baseline condition. This type is similar to our sequential-tasking condition in the previous paradigm. Second, in a *parallel strategy*, maximum overlap occurs, as consumers attend to both tasks at the same time. This type is akin to our multitasking condition in our prior, upfront paradigm in Study 2. Third, in an *interleaved strategy*, medium overlap occurs, in which consumers engage in task switching but allocate their attention to one specific task and suspend attention to other tasks. In other words, people switch between tasks and thereby multitask but attend to one task at a time. Our new web-app paradigm in Studies 3, 4, and 5 allowed for both a sequential strategy and an interleaved strategy of multitasking.

STUDY 3: MEASURING EFFICIENCY MOTIVATIONS

Study 3 had multiple goals. First, we wanted to test whether low feelings of control would lead to more multitasking within our new experimental paradigm (H1; see Appendix for a screen shot of the web-app). Second, we aimed to provide process evidence for our proposed mechanism. Specifically, we sought to show that low perceptions of control lead to increased motivations to use time efficiently and that this drives multitasking behavior (H2). Third, we wanted to see whether multitasking actually helps in reestablishing feelings of control. Fourth, we sought to determine how well-calibrated people were regarding the effect of multitasking on task performance *after* completing the tasks. Finally, we sought to rule out several alternative accounts, including increased sensation seeking tendencies (Jeong and Fishbein 2007), behavioral disinhibition tendencies (Jeong and Fishbein 2007), boredom (Hwang, Kim, and Jeong 2014), feelings of engagement, and lack of motivation to perform well (See Web Appendix 8 for stimuli and measures).

Method

Participants and design. One hundred and six students (55 females, mean age = 20.15) from a large university participated in the study for partial course credit. Six participants who failed the attention check were excluded from our analysis. The study had a 2-cell (Control: High vs. Low) between-subjects design.

Procedure. The study had two main parts: a control manipulation task and a web-app task. We began by manipulating perceived control, using the task from Study 1, and asking the same manipulation check item. Participants then were told that they would have about eight minutes to complete two additional tasks: a consumer decision making task and a video viewing task. We provided a detailed description of what participants would be doing for each task and the same performance incentive as in Study 1. After reading this information, participants were redirected to a web-app interface, in which an information screen explained that participants could switch between the two tasks whenever they wanted to do so by moving their mouse cursor.

The next screen was split into a left and right panel (Appendix). The left panel contained the consumer decision making task, and the right panel contained the video viewing task. Participants could choose the task they wanted to work on by hovering their cursor over that panel. When their cursor was over the left panel area, an opaque layer covered the right panel and the video was paused. When their cursor was over the right panel, an opaque layer covered the left panel, and the video (on the right panel) started to play. Using the opaque layer to hide the content of the other task follows prior study designs (Adler and Benbunan-Fich 2012, 2013), and it was an important element of the experiment design in that the app needed to allow both multitasking and sequential-tasking. In other words, if participants wanted to engage in pure

sequential-tasking, the experiment had to provide a task environment in which one could focus solely on one task without seeing any content of the other task. Unbeknownst to participants, the web-app counted the number of times participants switched over to a different task.

The consumer decision making task was another principal-agent decision making task adopted from prior work (Lurie 2004), in which participants were asked to purchase a specific product for a friend. Participants received a table describing the friend's preference structure and another table showing attribute information about the purchase options where a weighted sum score decision making approach would lead to one clear answer. For this consumer decision making task, participants viewed four of these information blocks on four separate pages and answered a product choice question for each block (i.e., four questions total across four pages). For the video viewing task, participants saw a video in which a YouTube reviewer discussed three portable Bluetooth speakers.

After eight minutes, participants were automatically directed to another webpage, which first asked them five questions about the video documentary (e.g., "What was the official battery life of the Bose speakers?"). Next, we measured participants' motivations to use time efficiently using the same three-item measure as the pilot test ("Completing the tasks as efficiently as possible," "Not wasting any time completing tasks," and "Minimizing time spent on tasks"; 1: Not important at all; 7: Very important). We then measured whether participants indeed felt higher control when multitasking by administering three measures: assessing agreement with two statements ("Having the ability to switch between the two tasks whenever I wanted to let me feel in control of my overall experience," "Having the ability to switch between the two tasks whenever I wanted to helped me feel that I was the driver of my overall experience"; 1: Completely disagree; 7: Completely agree) and directly asking "How much control did you feel

overall while completing the two tasks?" (1: Very little control; 7: Very high control). We also asked participants how engaged they felt, how satisfied they were with how they completed the tasks, how well they thought they did on the tasks, how motivated they were to do well on tasks, and how boring they thought each of the tasks was. Participants also answered the brief sensation seeking scale (Hoyle et al. 2002), the behavioral activation scales (BAS) and behavioral inhibition scales (BIS) (Carver and White 1994), and some demographic questions.

Results

Task switching behavior. We ran a one-way ANOVA with the task switch count data. The results revealed that those in the low (vs. high) control condition engaged in more multitasking (i.e., task switching) ($M_{\text{LowControl}}$ = 16.64, SD = 8.87 vs. $M_{\text{HighControl}}$ = 13.48, SD = 6.15; F (1, 98) = 3.95, p = .05, η_p^2 = .04), supporting H1.

Efficiency motivations. We averaged the three efficiency items to form an efficiency index (α = .67). A one-way ANOVA showed that low (vs. high) feelings of control led to increased motivations to use time efficiently ($M_{\text{LowControl}}$ = 5.70, SD = 0.85 vs. $M_{\text{HighControl}}$ = 5.14, SD = 1.19; F (1, 98) = 7.53, p = .01, η_p^2 = .07). Supporting H2, a regression analysis showed that increased efficiency motivations led to more multitasking (β = 1.67, t (98) = 2.21, p = .03, η_p^2 = .05) and further mediation analysis showed that an increase in efficiency motivations mediated the effect of perceived control on multitasking behavior (PROCESS model 4, indirect effect 95% CI: [-.9263, -.0695]; see fig. 2).

INSERT FIGURE 2 ABOUT HERE

Task Performance and Alternative Explanations. We next looked at how perceived control and multitasking affected overall task performance. A one-way ANOVA revealed that participants in the low (vs. high) control condition performed marginally worse overall ($M_{\text{LowControl}}$ = 6.22, SD = 1.72 vs. $M_{\text{HighControl}}$ = 6.81, SD = 1.44; F (1, 98) = 3.24, p = .08, η_p^2 = .03). A regression analysis showed that increased multitasking led to significantly worse overall performance (β = -.04, t (98) = -2.07, p = .04). To test the full causal effect of perceived control on task performance, we ran a serial mediation analysis using model 6 of the PROCESS macro. The results showed a significant indirect effect from perceived control to overall task performance via efficiency motivations and multitasking (indirect effect 95% CI: [.0029, .0524]). In other words, low (vs. high) perceived control led to increased efficiency motivations, which led to more multitasking behavior, which then ultimately resulted in worse overall task performance.

In contrast, our post-task expected performance items indicated that participants were not aware of these negative consequences. Two one-way ANOVAs showed that perceived control had no effect on either expected or post-task performance measures (both F's < 1, NS). In addition, a series of one-way ANOVAs did not support any of the tested alternative explanations, indicating that perceived control had no effect on our measures of task engagement, satisfaction, motivation to do well, perceived boredom, sensation seeking, BAS, or BIS (NS).

Reestablished feelings of control. To see whether multitasking let participants feel increased control, we averaged the three items measuring reestablished control (α = .82). A regression analysis revealed a significant effect of multitasking (β = .04, t (1, 96) = 2.2, p = .03), where more multitasking (i.e., task switching) led to greater feelings of control. Neither the main effect of control nor the interaction effect was significant (both F's < 1, NS). Moreover, a

mediation analysis revealed a significant indirect effect from perceived control to reestablished feelings of control, where low (vs. high) perceived control led to more switching behavior, and this behavior in turn led to higher feelings of reestablished control (PROCESS model 4, indirect effect 95% CI: [-.1650, -.0088]).

Study 3 established several core findings. First, we found support for H1 using our new web-app paradigm (also see Web Appendix Study C in Web Appendix 9, which replicated effects using different tasks). Second, we gained evidence for our proposed theory (H2), finding that low (vs. high) perceived control indeed increases participants' motivation to spend their time resources efficiently and that this increased motivation leads to greater multitasking behavior. Third, our post-task control measures indicated that the strategy to reestablish control by multitasking was successful; increased task switching led to greater feelings of control. Fourth, we again found evidence that multitasking may lead to decreased task performance. Moreover, the post-task expected performance measures indicated that participants were unaware of this detrimental effect of multitasking on performance. Finally, our additional measures cast doubt on alternative accounts, including task engagement, satisfaction, and motivation to do well. Having gained process evidence through mediation analysis, we next aimed to obtain further support for our theory by directly manipulating participants' motivations to use time efficiently.

STUDY 4: MANIPULATING EFFICIENCY MOTIVATIONS

If motivations to use time efficiently underlie the effect of consumers' feeling of low but not high control on multitasking behavior, we should expect that directly asking participants to use time efficiently will lead to different effects for those feeling low versus high control. First,

for those feeling low control, instructions to use time efficiently (vs. no instructions) will have a negligible effect on multitasking behavior, in light of our hypothesis that feelings of low control already increase motivations to use time efficiently. Second, for those feeling high control, instructions to use time efficiently (vs. no instructions) should lead to increased multitasking behavior. Third, for those who receive no instructions about using time efficiently, we should replicate our prior findings and see that low (vs. high) feelings of control lead to greater multitasking behavior. Study 4 tested these predictions. We also included a baseline condition that did not manipulate control to provide further evidence of a compensatory mechanism. The study and predictions were pre-registered at (https://aspredicted.org/vd8ki.pdf) and the stimuli are in Web Appendix 10.

Method

Participants and design. Three hundred and two students from a large university participated in the study for a small monetary reward. Twelve participants who failed the attention check were excluded from our analysis. The study had a 3-cell (Control: High vs. Low vs. Baseline) X 2 (Efficiency instruction: Yes vs. No) design.

Procedure. We first manipulated participants' perceived control using the procedure from Study 1. Next, participants were again told that they would be completing two additional tasks and that they would be given the option to switch between the tasks whenever they wanted to. In addition, half of the participants were instructed to use their time efficiently: "While doing the tasks, try to be as efficient as possible with your time. By efficient, we mean stretching your time so that you do more of the tasks using less time" (adapted from Fernbach et al. 2015). The other half of the participants did not read these two additional sentences. Afterward, participants

engaged in the same tasks as in Study 3.

Results

Task switching behavior. First, a two-way ANOVA revealed a significant main effect of efficiency instruction ($M_{\text{EffInstruct}}$ = 18.62, SD = 13.01 vs. $M_{\text{NoInstruct}}$ = 15.91, SD = 8.97, F (1, 284) = 4.29, p = .04). All other effects were non-significant (all F's < 1, NS). Next, based on our pre-registration, we conducted three planned contrast analyses to check the following three hypotheses: (1) $M_{\text{LowControl-NoInstruct}} > M_{\text{HighControl-NoInstruct}}$, (2) $M_{\text{LowControl-EffInstruct}} = M_{\text{LowControl-NoInstruct}}$, and (3) $M_{\text{HighControl-EffInstruct}} > M_{\text{HighControl-NoInstruct}}$. The results confirmed our a priori predictions (see fig. 3).

First, in support of H1 and replicating prior results, for participants in the no efficiency instruction condition, those feeling low (vs. high) control engaged in marginally more multitasking behavior ($M_{\text{LowControl-NoInstruct}}$ = 17.78, SD = 9.96 vs. $M_{\text{HighControl-NoInstruct}}$ = 14.26, SD = 7.83; F (1, 284) = 2.64, p = .10, η_p^2 = .01). Second, consistent with H2 (i.e., participants experiencing low control exhibit greater multitasking behavior due to time efficiency motivations), for those in the low control condition, instructions to use time efficiently (vs. no instruction) did not lead to a significant increase in multitasking behavior ($M_{\text{LowControl-EffInstruct}}$ = 18.55, SD = 14.50 vs. $M_{\text{LowControl-NoInstruct}}$ = 17.78, SD = 9.96, F < 1, NS). Third, for those in the high control condition, being instructed to use time efficiently (vs. no instruction) did lead to increased multitasking behavior ($M_{\text{HighControl-EffInstruct}}$ = 19.04, SD = 13.32 vs. $M_{\text{HighControl-NoInstruct}}$ = 14.26, SD = 7.83, F (1, 284) = 4.76, p = .03, η_p^2 = .02).

INSERT FIGURE 3 ABOUT HERE

Additionally, in support of multitasking as a compensatory control mechanism, in the no efficiency instruction condition, participants in the low control condition ($M_{\text{LowControl-NoInstruct}}$ = 17.78) exhibited directionally greater multitasking compared to the average of the baseline and high control conditions ($M_{\text{HighControl-NoInstruct \& Baseline-NoInstruct}}$ = 14.93; F (1, 284) =2.12, p = .146). As expected, all conditions displayed similarly high levels of multitasking behavior in the efficiency instruction condition, ($M_{\text{LowControl-EffInstruct}}$ = 18.55, $M_{\text{Baseline-EffInstruct}}$ = 18.27, $M_{\text{HighControl-EffInstruct}}$ = 19.04, F < 1, NS).

Task Performance. To explore how perceived control and the efficiency instruction affected task performance, we ran a two-way ANOVA. The results yielded a directional effect of efficiency instructions on task performance, where the efficiency instructions led to directionally deteriorated performance ($M_{\text{EffInstruct}}$ = 5.74, SD = 1.65 vs. $M_{\text{NoInstruct}}$ = 6.03, SD = 1.51, F (1, 284) = 2.57, p = .11; all other F's < 1.28, all other p's > .28). Moreover, a regression analysis revealed a marginal effect of multitasking behavior on task performance (β = -.01, t (288) = -1.71, p = .09). However, moderated mediation analysis (model 8 of PROCESS macro) did not show a significant indirect effect from perceived control to task performance (95% CI of highest order interaction: [-.0620, .0054]; see Web Appendix 10 for additional discussion).

In short, the results of Study 4 provided further support for our theory that motivations to use time efficiently underlie the effect of incidental control on multitasking (see Study 4a in Web Appendix 11 for replication of main findings). Participants feeling low control did not significantly increase their multitasking behavior when instructed to use time efficiently, presumably because they were already motivated to do so. In contrast, instructing people feeling high control to use time efficiently led to increased multitasking behavior. We note that, while

the a priori hypotheses regarding each condition were supported, small sample size or task calibration issues may have contributed to a non-significant interaction.

STUDY 5: INTERVENTION FOR CONSUMERS EXPERIENCING LOW CONTROL

The results of our prior studies show that consumers feeling low (vs. high or baseline) control are more motivated to use time resources efficiently and consequently multitask more. Notably, consumers who are feeling low control and thus are motivated to use time efficiently would engage in multitasking only if they believed it would help them do so. The results of our pilot study (also see Bardhi et al. 2010) affirmed that consumers hold the lay belief that multitasking enables them to use time efficiently. This suggests that a potential intervention to reduce multitasking behavior and the likely negative repercussions (Uncapher and Wagner 2018) for those feeling low control is to change their lay belief that multitasking enables them to be more time efficient. Specifically, if consumers do not believe that multitasking enables time efficiency, then we would not expect them to engage in more multitasking behavior, even when feeling low control. Alternatively, we would expect that reinforcing the belief that multitasking lets people use time efficiently would not lead to significantly increased multitasking activities because consumers already believe so. Put formally, we hypothesized:

> H3: For consumers experiencing low control, lay beliefs about multitasking will moderate the link between motivations to use time efficiently and multitasking behavior.

Study 5 tested this hypothesis by manipulating participants' prior beliefs about multitasking and time efficiency in three conditions. Given that our goal was to test the efficacy of this intervention among those feeling low control, we focused only on participants who were feeling low control. For the "Consistent" condition, participants were told that multitasking increases time efficiency. For the "Counter" condition, participants were told that multitasking decreases time efficiency. For the Low Control Baseline condition, lay beliefs were not manipulated. In addition, to boost the external validity of our findings, we used consequential choice tasks.

Method

Participants and design. Two hundred and twelve students (130 females, mean age = 20.81) from a university participated in the study. Data was collected the last week of March 2020, when the undergraduate participants were experiencing low control due to the world-wide COVID-19 pandemic, which caused the university to enact drastic changes the week prior – from in-person to remote learning. Seven participants who failed the attention check were dropped from analysis. The study had a 3 (Lay belief condition: Counter vs. Consistent vs. Low Control Baseline) cell design (see Web Appendix 12 for stimuli).

Pretest. A pretest (N = 93) verified whether participants were experiencing low control, by asking a separate group from the same population to indicate how much they agreed with the following two statements: "These days, I feel like I can get things done exactly the way I want to" and "These days, I feel I have a lot of control in my daily life" (1: Not at all, 7: Very) (α = .74). The results confirmed that participants felt low control in general (M = 3.58, difference from mid-point 4: t (92) = -2.68, p < .01).

Procedure. The study had two main phases. The first part manipulated participants' lay

beliefs by having them read a purported website article. Participants in the Consistent Lay Belief condition read an article titled "Multitasking Helps Us Be More Efficient with Our Time," which discussed how multitasking lets people work during waiting periods and that "…you'll often get more things done using less time when multitasking." Participants in the Counter Lay Belief condition read an article titled "Multitasking Makes Our Use of Time More Inefficient," which discussed how switching between different tasks incurs switching costs and that "…you'll often get less things done while using more time when you multitask." After reading the article, participants were asked to write a brief summary of the article and then, as a manipulation check, were asked what the main point of the article was (1: Multitasking increases time efficiency, 2: Multitasking decreases time efficiency, 3: Multitasking neither increases nor decreases time efficiency). Participants in the Low Control Baseline condition did not read any articles and thus did not answer the manipulation check question.

The second part of the survey was the web-app phase, where participants were given detailed information about the two tasks they would be completing: 1) reading seven reviews of foreign movies and TV series currently available on Netflix or Hulu and 2) a Youtube video that reviews three Bluetooth earbuds, all priced at $50. We stressed that participants should carefully complete the tasks because they would be entered into two lotteries: one for a $50 online video-streaming service voucher that would let them watch the movies or TV series of their choice and another for the $50 earbud model they selected.

Next, participants read the same web-app instructions from Study 3 and were also told that they would only be able to view the content once. The screen was again split in half, with the review reading task in the left panel and the video watching task in the right panel. After the multitasking phase, participants were directed to a new website, where they were asked to rank

the movies and TV series from their top pick (#1) to their least favorite pick (#7). They were then asked to write what they liked about their top pick and what they disliked about their least favorite pick. Next, participants were asked to identify which of the three earbud models they liked best and to write a short social media post about their chosen option.

Results

Manipulation check. A chi-square analysis showed that the lay belief manipulation was successful (χ^2 (2) = 114.19, $p < .0001$), where 96.97% of the counter belief condition participants answered the manipulation check correctly and 92.86% of the consistent belief condition participants answered the manipulation check correctly. Below, we report our analyses for all participants (excluding those who answered the manipulation check incorrectly produced similar results, see Web Appendix 12).

Task switching behavior. A one-way ANOVA revealed a significant main effect of lay theory manipulation (M_{Counter} = 12.55, SD = 8.85 vs. $M_{\text{Consistent}}$ = 17.36, SD = 13.06 vs. $M_{\text{LC-Baseline}}$ = 16.91, SD = 13.16, F (2, 202) = 3.66, p = .03, η_p^2 = .04). Confirming our predictions, planned contrasts revealed that participants who read that multitasking decreases efficiency (Counter Lay Belief) engaged in significantly less multitasking (i.e., task switching) behavior compared to those in the Low Control Baseline condition (F (1, 202) = 4.26, p = .04, η_p^2 = .02) and to those who read that multitasking increases efficiency (Consistent Lay Belief) (F (1, 202) = 6.31, p = .01, η_p^2 = .03). Moreover, as predicted, the difference in multitasking behavior between the Low Control Baseline condition and the Consistent Lay Belief participants was non-significant ($F < 1$, NS).

Study 5 highlighted a potential intervention to reduce multitasking behavior for people

feeling low control and provided further support for our theory that people feeling low control engage in more multitasking behavior because they believe multitasking can help them use their time more efficiently (H2). Specifically, building on our theory that motivations to use time efficiently underlie the effect of perceived control on multitasking behavior, we found that telling people experiencing low control that multitasking does not help them to use their time efficiently led to decreased multitasking behavior compared to a low control baseline condition. Furthermore, by replicating our previous findings while using consequential choice tasks for two common activities of our participants (i.e., reading reviews of TV and movie series and viewing Youtube reviews for earbuds), we boosted the external validity of our findings. Finally, given that we did not explicitly manipulate perceptions of control in the current study, we believe the results provide support for the view that consumers may engage in increased multitasking behavior while experiencing societal events that may significantly impact consumers' perceptions of control (e.g. pandemic or financial crises).

GENERAL DISCUSSION

In this paper, we investigated how an important consumer variable, perceptions of control, can influence consumers' multitasking behavior. Building on prior work on compensatory control (Durante and Laran 2016; Kay et al. 2009) and multitasking (Bardhi et al. 2010), we predicted that incidental feelings of low (vs. high) control would increase people's multitasking tendencies and that this tendency would be driven by people's motivation to use their time more efficiently. We found support for these claims across numerous studies using different control manipulations, different consumer tasks, and two different multitasking paradigms.

In Studies 1 and 2, we explicitly asked participants about their preference or choice to multitask. Study 1 showed initial evidence that low (vs. high or baseline) feelings of control cause people to want to multitask more for subsequent tasks and also found support for a compensatory control mechanism. Study 2 expanded on these findings by replicating the effect of control on multitasking tendencies, while documenting the negative downstream consequences of multitasking on consumer task performance. In Studies 3 through 5, we employed a web-app paradigm (adapted from Adler and Benbunan-Fich 2013), in which all participants were given the freedom to multitask and their task switching behavior was measured while they were working on two different tasks. Study 3 showed that our effects held for the new multitasking paradigm and ruled out several alternative accounts. Importantly, the study provided support for our proposed mechanism by showing that low (vs. high) perceived control leads to more multitasking and that this effect is driven by motivations to use time efficiently. Study 4 provided further process evidence by directly manipulating efficiency motivations and finding that this manipulation increased multitasking for those feeling high control but not for those feeling low control. Finally, Study 5 explored a theory-driven intervention (i.e., telling participants that multitasking does not help people to use time efficiently) that decreased multitasking behavior for those experiencing low control due to a pandemic.

Table 1 summarizes the results of perceived control on multitasking in our five main studies and seven Web Appendix studies. We conducted a single-paper meta-analysis (McShane and Böckenholt 2017) using the metafor package in R to ascertain the effect of perceived control on consumer multitasking behavior. Because our data for Studies 2, 2a, and Web Appendix Study B represented a binomial choice (i.e., multitask vs. sequential-task) between two groups (i.e., high vs. low control) and thus resulted in a 2 X 2 table form, we used the Mantel-Haenszel

method (Mantel and Haenszel 1959). The meta-analysis results indicated an aggregated odds ratio of .5172 and the 95% confidence interval was [.3464, .7722]. Moreover, a Cochran-Mantel-Haenszel test confirmed that the overall effect was significant (χ^2 (1) = 9.83, $p < .002$). The dependent measures for Studies 1, 1a, 3, 4, 4a, Web Appendix Studies A, C, and D were all continuous (Study 5 was excluded as it had no high control condition), so we calculated Cohen's d. The results indicated an effect size of .36 and the 95% confidence interval was [.2431, .4838].

INSERT TABLE 1 ABOUT HERE

Together, our two experimental paradigms cover the full spectrum of multitasking identified in the literature (Adler and Benbunan-Fich 2012). Our initial upfront paradigm, in which participants either chose to multitask or chose to perform the two tasks sequentially prior to beginning the tasks, allowed us to establish that consumers feeling low (vs. high) control prefer to multitask and put themselves in situations amenable to multitasking. Our web-app paradigm found consistent effects of perceived control on multitasking when participants had freedom to switch between tasks. As a next step, future work might try using eye-tracking to measure consumer multitasking behavior in an unobtrusive manner.

Contributions and Managerial Implications

The findings of our paper make significant contributions to the literature on multitasking, consumers' perceived control, and resource efficiency, while also providing practical implications. Our paper is among the first to identify an incidental variable – feelings of control – as an antecedent to multitasking behavior. The select works that have looked into predictors of

multitasking (Duff et al. 2014; Jeong and Fishbein 2007) have been limited to demographic and individual difference variables, making it difficult to identify incidental situations when consumers might multitask or come up with interventions that influence multitasking behavior. We address this gap in the literature by highlighting perceived control as an incidental antecedent factor for consumers' multitasking behavior, and we show the generalizability of the effect by using various manipulations of perceived control and different multitasking paradigms. Importantly, whereas past work relied solely on correlational analyses, we provide experimental evidence and therefore provide a stronger causal case. In addition, by highlighting the volitional aspect of consumers' multitasking behavior, we help to distinguish multitasking from other related constructs, such as distraction and cognitive load, while providing a more ecologically valid view on multitasking.

Our results may provide further insight into how consumers use their resources. For instance, consumers feeling low control may not allocate enough time for future tasks because of self-imposed pressures to use time efficiently. As a result, this time crunch could potentially lead to task underachievement and further fuel feelings of low control. Future research might also examine the effect of incidental control on monetary resources. For instance, the efficiency motivations of consumers experiencing low control may foster greater receptivity to price promotions. Finally, future work also might study how different forms of control, such as power, defined as the amount of control over valued resources in a social context (Rucker, Galinsky, and Dubois 2012), influence efficiency motivations.

Our findings also have several implications for managers and policy makers. Both prior research (Brasel and Gips 2011; Ophir et al. 2009; Atalay, Bodur, and Bressoud 2017) and our results indicate that multitasking can hinder consumers' memory recall of advertising material

and also can lead to suboptimal decision making. The fact that many online shoppers are multitasking (Hagai 2018) may be one factor that could account for the high product return rate for online purchases (Statista 2018). Thus, marketing managers and policy makers need to know when and why consumers might be more prone to multitasking and also how to lessen multitasking behavior. Our findings highlight the importance of helping consumers to feel in control for normative consumer decision-making. For instance, providing sufficient choice options (Inesi et al. 2011) or enabling consumers to format information on product websites could lead to consumer perceptions of greater control. For public policymakers, informing consumers that multitasking does not result in efficient use of time (see Study 5 results) could encourage consumers to focus on one task at a time.

Additional Questions and Future Research Directions

Our studies found support for perceived control and efficiency motivations as key antecedents of consumer multitasking behavior, while ruling out other factors, such as sensation seeking, boredom, motivation to perform well, BIS, and BAS. Given that this paper is among the first to investigate antecedents to multitasking behavior and its consequences in an experimental setting, the findings open up a plethora of interesting questions and new research directions.

Other Motivations for Multitasking. One advantage of the web-app paradigm was that we were able to examine the data in a longitudinal fashion, viewing the number of switches in 30-second windows. An examination of Study 3, Study 4, and Web Appendix Study C data showed a bimodal pattern, with two peaks of task switching between the initial 0 to 120 second mark and between the ending 360 to 450 second mark for both 8 minute (480 seconds) studies (see Web Appendix 13). To explore this pattern, we conducted a follow-up study (Web Appendix Study D

in Web Appendix 14) of 213 students (minus 19 who failed the attention check) using the same procedure and stimuli as Study 3. However, in this case, we stopped the study at the two-minute or seven-minute mark to assess participant efficiency motivations in a 2 (Control: High vs. Low) X 2 (End time: two-minute vs. seven-minute) between-subjects design. We found that participants appeared to have different motivations for multitasking, depending on how long they had been working on a task. Specifically, the results suggest that consumers may be multitasking with intentions of using their time efficiently toward the end of task completion, but consumers may have nuanced differences in their motivations for multitasking when they are just beginning to work on multiple tasks. Thus, future work can look more deeply into multitasking motivations when consumers who are feeling low control start working on tasks including higher task scanning and a higher sense of curiosity (Wiggin, Reimann, and Jain 2019).

Control as Trait. If the need to feel in control is indeed driving people's multitasking behavior, we would also expect to find that those who chronically want to feel greater control also tend to multitask more. To test whether our findings generalize to control as a trait, we investigated whether individual differences in need for control affected people's preference to multitask (Web Appendix Study E in Web Appendix 15). In the study (N = 101, mean age = 20.51), we measured participants' desirability for control (DFC; Burger and Cooper 1979) and preference to multitask. The data showed that those who had high desirability for control also preferred to multitask more ($\beta = 0.88$, t (99) = 2.30, $p = .02$). The results show the robustness of our effects for control as a trait and as an incidental variable.

Efficacy of Multitasking to Restore Control. Study 3 provided preliminary evidence that multitasking helped to reestablish feelings of control. However, we expect that this control restoration effect from multitasking is contingent on numerous factors, including whether

consumers' actual experience matches up to their time efficiency expectations. For instance, Etkin and Mogilner (2016) found that working on multiple activities across an hour (versus across a day) resulted in lower subjective well-being because of perceptions of *decreased* productivity. Yet, as our pilot study showed, and Study 5 affirmed, consumers' lay beliefs that multitasking enables efficiency persist. These conflicting findings call for additional research on moderating factors or specific task combinations that can help consumers actually achieve efficiency and give them feelings of control again. Particular attention could be paid to whether consumers continue to multitask, despite long-term decreased performance, because of short-term feelings of restored feelings of control.

Relationship Between Multitasking and Task Performance. Consistent with prior research (Uncapher and Wagner 2018), we found a consistent negative effect of multitasking on task performance in all our main studies. However, our results regarding the indirect effect of perceived control on task performance via multitasking was mixed (see Web Appendix 16). While this indirect effect was not the focus of our paper, we speculate that the mixed results could have potentially been due to low control participants putting in more effort (Cutright and Samper 2014) in addition to trying to use their time resources efficiently.

Moreover, while we found the predicted negative effect of multitasking on task performance, we still believe that there may be undiscovered boundary conditions and moderators regarding the effect of multitasking on task performance. Specifically, to be consistent with prior operationalizations of multitasking (Adler and Benbunan-Fich 2012) and to control for any task-specific effects, the tasks we used in our studies were unrelated to each other. However, future research might look into whether situations where the tasks are interrelated lead to better or worse decision-making. For instance, a consumer trying to purchase

a camera might be reading a written website review while also listening to a YouTube review about the same product. Indeed, Uncapher and Wagner (2018) find that, although multitasking leads to negative task performance on average, task characteristics that help minimize cognitive switching costs of multitasking mitigates this negative impact. Relatedly, Srna, Schrift, and Zauberman (2018) found that merely framing a single task as two intertwined tasks (e.g., framing a transcribing task as a dual task of listening and recording) enhances stimulation, which can subsequently enhance performance.

In addition, our multitasking context involved one text reading task and a second video task that were intentionally neutral in terms of valence and equal in terms of importance (i.e., there was no "focal" task). Future research might change the task configuration to examine cases where consumers mix and match tasks of different valences (e.g., researching life insurance policies [negative valence] and listening to music [positive valence]). Although multitasking might negatively affect task performance, doing an unenjoyable but beneficial task along with an enjoyable task might increase consumers' likelihood of persisting on the unenjoyable task. This may be important for tasks where persistence is more important than quality of performance.

Finally, future work could look into specific situations where multitasking might lead to significantly better task performance. For instance, while task switching usually leads to negative performance, multitasking may lead to positive outcomes when it comes to creativity tasks by providing people with a brief "incubation" period (Burroughs, Moreau, and Mick 2008), allowing previously activated thoughts to create new linkages (Kapadia and Melwani 2020).

Detrimental Effect of Multitasking and Miscalibration. Another finding from our studies was that participants did not seem to be aware of the potential negative effect of multitasking on their task performance. This finding is in line with the prior literature suggesting that people have

little insight into their multitasking behavior (Brasel and Gips 2011). Several accounts may explain why people are miscalibrated regarding an activity they likely engage in often. First, participants might have expected some negative effect but underestimated its magnitude. Second, people often do not receive immediate feedback regarding their performance and so may not learn about the extent of the negative effects. For example, consumers who make suboptimal product choices while multitasking might not make the connection if consumption occurs several days after purchase. Third, while our studies measured participants' conscious choice to multitask, real-world multitasking behavior may happen habitually or unconsciously. Future research could delve into the question of when consumers learn about the harmful effects of multitasking and when they are oblivious, as well as identify different metrics of multitasking performance.

Expanding on the Notion of Efficiency. We adopted the definition of efficiency from prior literature (Fernbach et al. 2015; Johnson et al. 2008; Keinan and Kivetz 2011; Mick and Fournier 1998; Murray and Häubl 2007) and focused on consumer motivations to minimize time spent while completing the same amount of tasks. Such an operationalization may seem most pertinent for consumers satisficing rather than optimizing their product decisions (Simon 1955). Yet, even for tasks that are maximizing in nature, consumers might have difficulty gauging how well they did or would have done on a specific task compared to a baseline because they lack information on how well others usually do or how well they themselves would have done under different circumstances. In contrast, the number of tasks completed and the amount of time spent are easily quantifiable. Thus, consumers who need to complete multiple tasks and who are motivated to use their time efficiently are more likely to focus on using less time to get everything done (Fernbach et al. 2015). However, future work could consider an expanded view of efficiency by

looking not only at the aspect of saving time, but also at the task outcome quality (Adler and Benbunan-Fich 2012) and at the consistency of task performance across time.

Conclusion

This research advances our understanding on the antecedents of consumer multitasking behavior by experimentally showing that incidental feelings of low control lead to increased multitasking behavior for consumers and that an increase in their motivation to be efficient with time underlies this effect. We also generally find evidence that multitasking can negatively affect consumer decision making. By highlighting an important aspect of modern consumer behavior, we hope this paper opens up new research directions to enrich our understanding of consumer multitasking behavior and its implications.

DATA COLLECTION INFORMATION

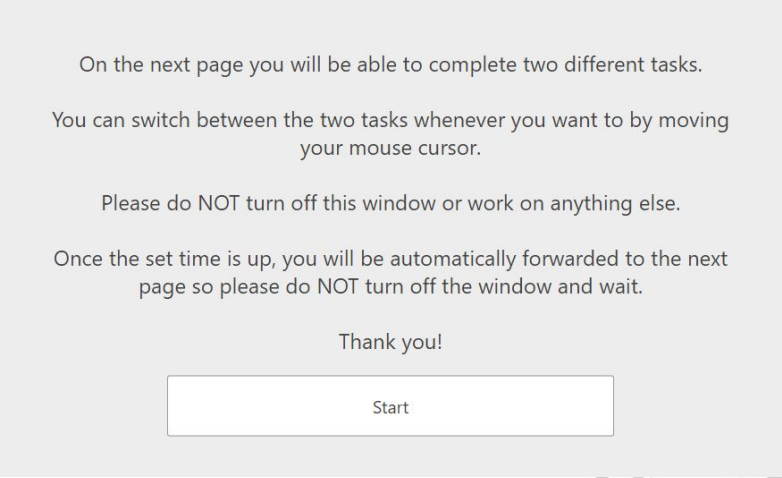
The first and second author jointly supervised the collection of data by research assistants at the University of Texas at Austin Behavioral Lab for Web Appendix Study A (spring 2017), Study 2 (fall 2015), Study 2a (2016), Web Appendix Study B (spring of 2015), Study 3 (spring 2018), Web Appendix Study C (winter 2017), Study 4 (fall 2020), Study 4a (fall 2018), Web Appendix Study D (spring 2019), and Web Appendix Study E (spring 2016). The behavioral lab manager supervised the collection of data by research assistants at the University of Technology Sydney Behavioral Lab for Study 1 (spring 2019) and Study 5 (spring 2020). Data for the pilot study and Study 1a was collected on Amazon Mechanical Turk by the first author in early 2020. The first author analyzed the data for all studies. The data can be accessed at:

https://www.dropbox.com/sh/onynlmnqg869xn1/AAAahXaFzyYYsF2F00XsiVz7a?dl=0

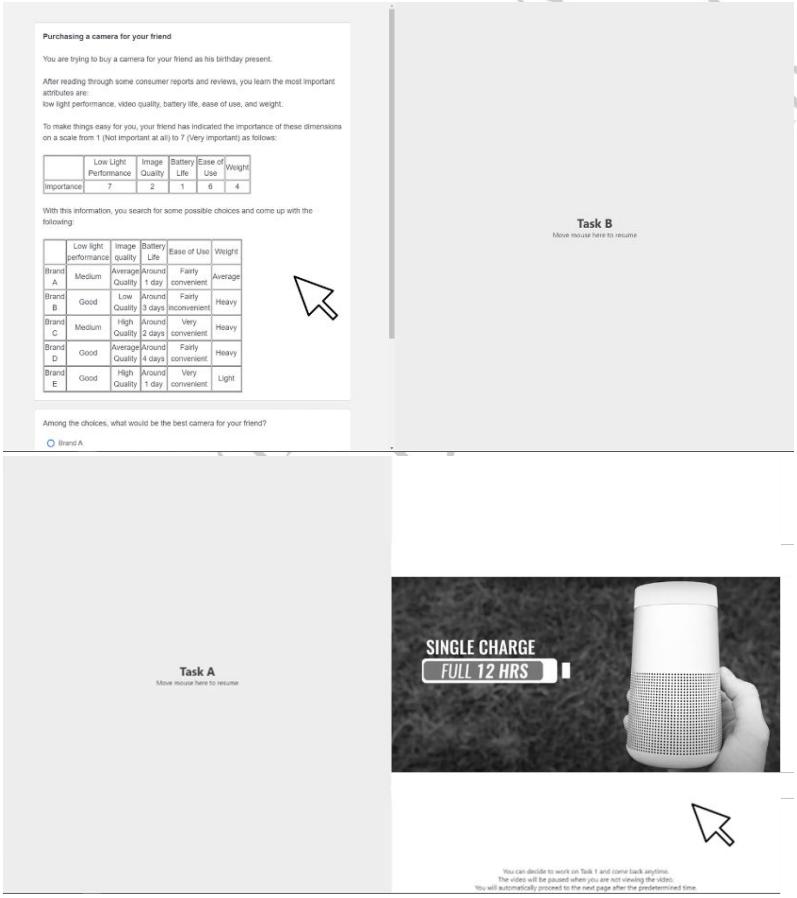
APPENDIX

Web-App Interface in Study 3

Opening page (what participants saw once web-app initiated):



Example screenshot of doing consumer decision making task (left panel) and video viewing task (right panel) (mouse pointer size increased for graphical illustration)



Youtube video link for Study 3: https://youtu.be/U_wpyirPqeU

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TABLE 1

MEAN COMPARISONS ACROSS ALL STUDIES

Study	Experimental Paradigm	DV (MT = Multitask)	Low Control	High Control
1	Upfront Choice	Preference (7-point scale) to MT	3.09	2.16
1a (in Web Appendix [WA])	Upfront Choice	Preference (7-point scale) to MT	2.92	2.23
WA Study A	Upfront Choice	Preference (7-point scale) to MT	3.37	2.64
2	Upfront Choice	Choice (%) to MT	44.93%	29.17%
2a (in WA)	Upfront Choice	Choice (%) to MT	32.35%	18.57%
WA Study B	Upfront Choice	Choice (%) to MT	37.50%	25.00%
3	Web-app	Number of task switches	16.64	13.48
WA Study C	Web-app	Number of task switches	27.97	21.67
4	Web-app	Number of task switches	17.78 (NoInstr)	14.26 (NoInstr)
			18.55 (EffInstr)	19.04 (EffInstr)
4a (in WA)	Web-app	Number of task switches	17.17 (NoInstr)	11.90 (NoInstr)
			19.65 (EffInstr)	17.13 (EffInstr)
WA Study D	Web-app	Number of task switches	15.00 (7 minute)	11.91 (7 minute)
			6.62 (2 minute)	5.45 (2 minute)

FIGURE 1

STUDY 2: EFFECT OF MANIPULATED CONTROL ON CHOICE TO MULTITASK

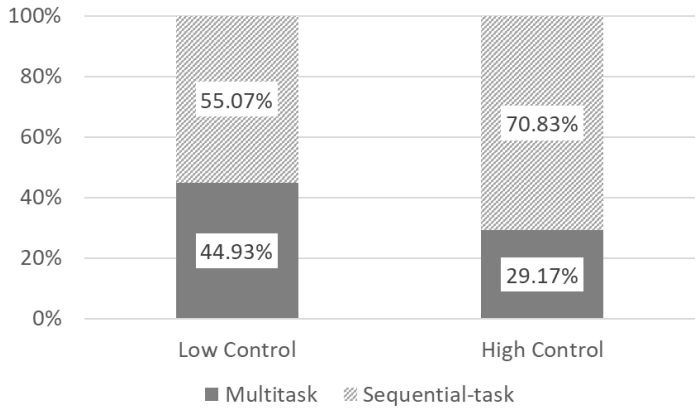


FIGURE 2

STUDY 3: MEDIATION ANALYSIS RESULTS

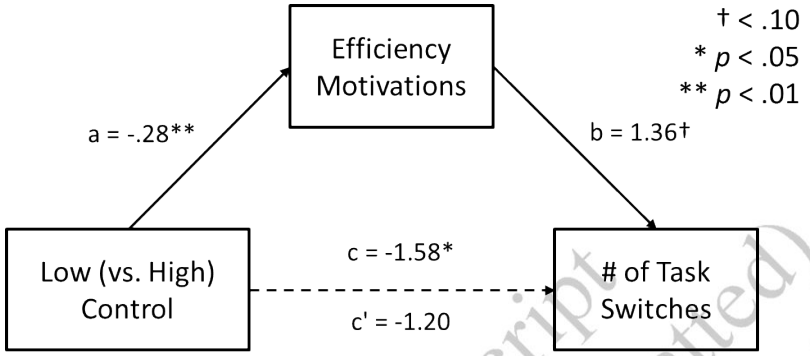
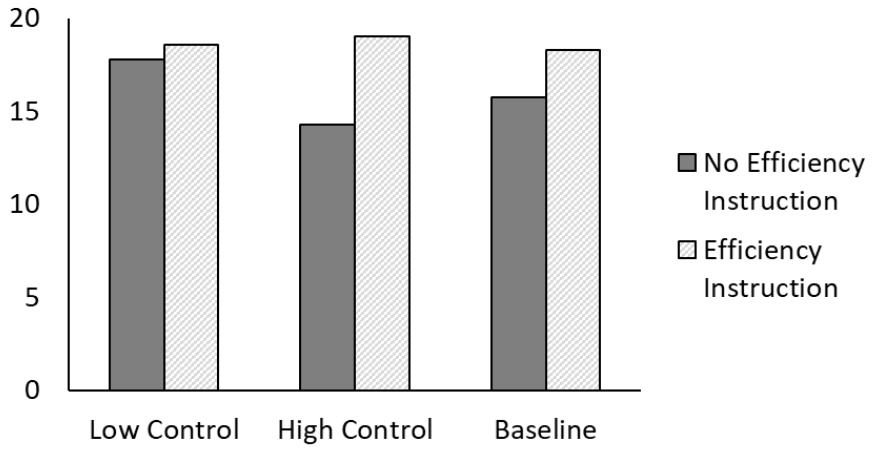


FIGURE 3

STUDY 4: TASK SWITCHING BEHAVIOR BASED ON

PERCEIVED CONTROL AND EFFICIENCY INSTRUCTION



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