Inaction Traps in Consumer Response to Product Malfunctions

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ABSTRACT

The authors develop and test a theory of consumer inaction traps in the domain of decisions to either address or endure product malfunctions. According to this theory, the magnitude of product malfunctions can have a paradoxical effect on consumption experience. In particular, the less severe a product malfunction is, the more inclined consumers are to defer the initial decision about whether to take corrective action. Subsequent opportunities for corrective action are devalued relative to previously forgone ones. This dynamic tends to trap consumers in a state of inaction, resulting in their enduring smaller malfunctions longer than larger ones. A consequence of these inaction traps is that minor product malfunctions may result in less enjoyable overall consumption experiences than more severe defects. Evidence from eight experiments and a survey provides support for this theorizing by demonstrating the inaction-trap phenomenon, examining its downstream consequences, shedding light on the psychological dynamics of inaction, and identifying boundary conditions that suggest interventions for counteracting consumers’ vulnerability to suffering disproportionately from relatively minor product malfunctions.

Keywords: consumption experience, enjoyment, product malfunctions, consumer inaction, decision dynamics.
Consumers frequently experience product malfunctions. However, these malfunctions are often not so severe that they prevent further use of the product. For instance, it is possible to continue to use a phone after its display gets scratched, wear a shirt that is missing a button, or drive a car with a broken clock. Thus, consumers must often choose between either addressing or enduring a product malfunction. While we strive to make good use of our time, effort, and money by addressing malfunctions that seem worth the cost and enduring others that do not, we sometimes become trapped in ruts where corrective actions are not taken and malfunctions that could, and perhaps should, have been addressed long ago are endured indefinitely. This research examines the conditions that may trap consumers into enduring certain product malfunctions, the decision-making dynamics that reinforce such failures to take corrective action, and the consequences of these dynamics for people’s enjoyment of consumption experiences.

Research on consumer choice typically focuses on purchase decisions (e.g., Bettman, Luce, and Payne 1998; Dhar and Wertenbroch 2000; Ge, Brigden, and Häubl 2015; Ratner, Kahn, and Kahneman 1999; Simonson 1989). In contrast, there has been virtually no research on consumers’ decisions related to the maintenance or repair of products that they own already (for an exception, see Meyer 2016), let alone on the consequences of such decisions for consumers’ enjoyment of these products. The present work takes an important step towards filling this gap. It focuses on the psychology of consumer response to product malfunctions.

We introduce and test a theoretical framework for understanding the psychological forces that govern consumers’ decisions about whether and when to take action to correct product malfunctions, and the effect of these decisions on the enjoyment of consumption experiences. According to this theory, smaller product malfunctions tend to be endured longer than larger ones because consumers are more likely to forgo initial opportunities to take corrective action
and then devalue subsequent opportunities, resulting in an inaction trap, ultimately reducing enjoyment of the consumption experience.

**THEORETICAL FRAMEWORK**

*Product Malfunctions*

We define a product malfunction as a sudden, unexpected decline in a product’s performance or functionality. Prior work on product malfunctions has generally focused either on consumer complaining behavior (Dunn and Dahl 2012; Gilly and Gelb 1982) or on the effectiveness of firms’ attempts to recover from such failures (Challagalla, Venkatesh, and Kohli 2009; Maxham and Netemeyer 2002). The current research instead examines how consumers make decisions to address or endure product malfunctions, and how these actions, or a lack thereof, impact consumption experiences.

Product malfunctions can vary on dimensions other than severity. For instance, they may also differ in their consistency and trend. Malfunctions may escalate, decline, or remain constant over time. Moreover, malfunctions can be either intermittent, where consumption experience is only compromised some of the time, or continuous, where the malfunction always impacts the experience. In our experiments, we examine how these aspects of the malfunction affect decisions to take corrective action and consumption experiences.

*Taking Corrective Action to Address a Malfunction*

We define the act of addressing a malfunction as a *corrective action* that restores a malfunctioning product to its desired working state. Corrective actions include repair performed by the consumer, repair performed by another party, and product replacement. Repairs are distinct from maintenance in that the latter preserves product performance by preventing a product from deteriorating into a problem state, whereas repair restores a product to its normal working state. Corrective actions involve costs in the form of time, effort, and/or money.
Although the cost of corrective action may be a function of malfunction severity, this cost is often fixed and independent of severity, such as when taking corrective action involves replacing the entire product, or a major component of it (for instance, the screen of a smartphone).

Whether or not corrective action is taken is governed by multiple forces. The cost of corrective action is typically immediate while the benefit of consuming the product with fully restored functionality is accrued over time. Not all malfunctions warrant corrective action. However, even for ones that do, the pattern of costs and benefits can lead consumers to fail to take corrective action. First, consumers may be myopic and focus too much on current costs rather than future benefits (Frederick, Loewenstein, and O’Donoghue 2002; Zauberman 2003). Moreover, they may mispredict the impact of corrective action on consumption experience, consistent with the notion of affective forecasting errors (Wilson and Gilbert 2003). Finally, in line with prior findings on decision deferral (Anderson 2003; Dhar 1996, 1997; Dhar and Nowlis 1999; Greenleaf and Lehmann 1995), consumers may anticipate future opportunities to address a malfunction and, thus, postpone the decision about whether to take corrective action.

**Psychological Dynamics of Forgoing Opportunities for Corrective Action**

Forgoing an opportunity to take corrective action can affect the perceived attractiveness of subsequent opportunities. Decision makers may evaluate the current opportunity for action relative to previously forgone opportunities and, when that comparison is unfavorable to the current opportunity, devalue the current opportunity and, as a consequence, be less likely to take it. People’s tendency to pass up on otherwise attractive opportunities for action when a previously forgone opportunity appears superior has been labeled “inaction inertia” (Tykocinski, Pittman, and Tuttle 1995), and has been demonstrated in various domains (Arkes, Kung, and Hutzel 2002; Butler and Highhouse 2000; Kumar 2004; van Putten, Zeelenberg, and van Dijk 2007, 2009; Tykocinski, Israel, and Pittman 2004; Tykocinski and Pittman 1998; Zeelenberg et
al. 2006). Our theorizing aligns with the devaluation-based account of inaction inertia (Zeelenberg et al. 2006), whereby otherwise attractive opportunities for action are not taken because they appear relatively inferior to previously forgone opportunities. This mechanism explains consumers’ persistent failure to take corrective action following initial inaction.

As a smaller malfunction is more likely to go unaddressed initially, this in turn reduces the likelihood that subsequent opportunities for corrective action will be taken, prolonging the malfunction and rendering the consumption experience less enjoyable than it would have been with a larger, promptly addressed product malfunction. This is a behavioral analog to the psychological immune response, where minor emotional threats can cause greater suffering than more significant ones because they fail to trigger psychological countermeasures (Gilbert et al. 2004; Wilson and Gilbert 2003). The possibility that smaller physical problems could cause greater suffering when left unaddressed was suggested in that prior work and used as a metaphor for how the emotional immune system might function. The present research is the first to empirically examine this paradox in the domain of physical challenges.

The essence of our theorizing is as follows. Less severe product malfunctions tend to trap consumers into not taking correction action. This occurs because of the interplay of two forces: (1) Due to its smaller magnitude, a less severe malfunction fails to motivate the consumer to take corrective action when the malfunction is first encountered. (2) The consumer is less likely to address the malfunction later due to the devaluation of subsequent opportunities for corrective action. This dynamic causes smaller product malfunctions to persist longer than larger ones, resulting in less enjoyable overall consumption experiences.

We present evidence from eight experiments and a consumer survey that test our theorizing about the psychological dynamics that govern decisions about whether and when to take corrective action to address product malfunctions, demonstrate the impact of these decisions
on consumption enjoyment, show downstream consequences of these decisions and experiences, examine potential alternative accounts, and identify boundary conditions that suggest interventions for counteracting consumers’ vulnerability to suffering disproportionately from relatively minor product malfunctions.

**EXPERIMENT 1**

The objective of this experiment was to demonstrate that it is possible for a smaller product malfunction to lead to a worse consumption experience than a larger malfunction, and that this effect is driven by differences in whether and when the malfunction is addressed.

**Method**

Eighty-four undergraduate students at a major North-American University completed the study in a behavioral research lab in exchange for partial course credit. Participants watched a 10-minute video of a stage performance by a stand-up comedian (see the Web Appendix for screenshots). Before beginning, they were forewarned that the video player would malfunction, producing short bursts of audio static. Participants were also informed that, at any time during the video-watching experience, they could take costly corrective action to get rid of the bursts of static. The cost of doing so was that, once a participant clicked a designated button, the video would continue to play, but its audio would be muted for one minute, after which the audio would be restored, and no further bursts of static would occur. Participants were randomly assigned to one of two conditions that differed in the severity of the malfunction. In the smaller malfunction condition, short (2-4 second) bursts of audio static occurred twice per minute. In the larger malfunction condition, the same bursts occurred eight times per minute. Participants were informed at the outset that that, unless they took corrective action, the malfunction would persist at a constant rate for the entire 10-minute video-watching experience. Prior to the start of the experience, all participants watched 30 seconds of a different video with the malfunction present.
(at the magnitude associated with their assigned condition). They then indicated how annoying they perceived the malfunction to be (0=“not at all” to 10=“extremely”) before starting the focal 10-minute video-watching experience. Upon completion of that experience, participants indicated how much they enjoyed it (0=“not at all” to 10=“very much”).

**Results**

As expected, participants in the smaller malfunction condition found the static to be less annoying ($M=8.88$) than those in the larger malfunction condition ($M=9.58$; $t(82)=3.03, p=.001$). Critically, participants in the smaller malfunction condition enjoyed the experience less ($M=6.72$) than those in the larger malfunction condition ($M=7.98$; $t(82)=2.37, p=.02, d=0.52$). In line with our theorizing, this effect appears to be driven by how participants responded to the malfunction. The timing of participants’ corrective actions in the two conditions is illustrated in Figure 1. (The graph only includes the first 200 seconds of the experience as nobody addressed the malfunction after that point.) Participants in the smaller malfunction condition were less likely to ultimately take corrective action (65%) than those in the larger malfunction condition (88%; $\beta=1.35, z(83)=2.35, p=.02$). Consistent with this finding, participants in the smaller malfunction condition on average endured the malfunction longer ($M=216s$) than those in the larger malfunction condition ($M=77s$; $t(82)=2.78, p=.007$).

[Insert Figure 1 about here]

**Discussion**

Although participants in the smaller malfunction condition faced an objectively better reality, they ended up enjoying their overall experience less because they were less likely to correct the malfunction, suffering its detrimental impact over a longer period of time. This finding is consistent with the inaction-trap account. Smaller product malfunctions tend not to be
addressed immediately, and subsequent opportunities for corrective action are gradually devalued relative to those previously forgone.

**EXPERIMENT 2**

The theorizing that underlies the proposed inaction-trap mechanism posits that consumers tend to initially defer the decision to address a smaller malfunction and then devalue subsequent opportunities for corrective action as the latter appear relatively less attractive than opportunities that were initially forgone. Experiment 2 was designed to directly examine the pivotal role of initial deferral in this mechanism. To that end, the opportunity for corrective action was either (1) continuously available throughout the consumption experience or (2) limited to a single point in time prior to the start of the experience. In the latter case, deferral was not an option, and thus the dynamics that might otherwise have resulted in an inaction trap were disabled. Our hypothesis was that a larger malfunction would result in a more enjoyable consumption experience when corrective action could be taken at any point, whereas this effect would not be observed when there was only a single opportunity to take corrective action.

Experiment 2 also examined whether, in addition to influencing consumption enjoyment, allowing smaller product malfunctions to persist due to the dynamics of inaction might also affect consumers’ attitudes towards the product and their intentions to use it in the future. Finally, this experiment was designed to examine the inaction-trap phenomenon in a conceptually different domain – involving an active rather than a passive consumption experience – and with effort as the cost of corrective action.

**Method**

A total of 398 adult U.S. residents, recruited through Amazon Mechanical Turk, completed the study in exchange for a $2 payment. The consumption experience was playing the interactive game “Snake” for 10 minutes (see the Web Appendix for screenshots). In this game, a
player controls the movement of a snake within a rectangular space using the arrow keys on
his/her keyboard and seeks to have the snake eat pieces of fruit (one at a time) while trying to
avoid crashing into walls or into the snake’s own body. Eating a piece of fruit earns points and
increases the length of the snake’s body. Whenever the snake crashes, a new round begins.

At the outset, participants were informed that there was a malfunction of the game in the
form of recurring random moves of the snake (turning left or right) that were not player-initiated.
They were also informed that it was possible to get rid of this malfunction by completing a
“number task” that involved entering 20 single-digit numbers into a text box, one at a time.

Participants were randomly assigned to one of the four conditions of a 2 (malfunction
magnitude: smaller vs. larger) x 2 (opportunity for corrective action: ongoing vs. beginning only)
between-subjects design. In the smaller malfunction conditions, random moves of the snake
occurred 3 times per minute. In the larger malfunction condition, these occurred 20 times per
minute. Participants in the ongoing-opportunity conditions could take corrective action at any
time during the game-playing experience. Those in the beginning-only conditions had to decide
prior to the start of the experience to either take corrective action at that point or endure the
malfunction for the entire 10 minutes.¹ Once a participant indicated that s/he wished to address
the malfunction by clicking a designated button, the number task was initiated. Upon completion
of the number task, the game resumed without any further random moves.

Prior to the focal experience, all participants first played a 30-second practice round of
the game without malfunction. Next, they played the game for one minute with the malfunction
present (at the magnitude associated with their condition) and then indicated how annoying they

¹ Note that, unlike the ongoing-opportunity conditions, the beginning-only conditions required an active choice.
perceived the malfunction to be (0=“not at all” to 10=“very much”). After that, they completed a preview of the number task to ensure that they understood the cost of corrective action.

Upon completion of the game-playing experience, participants indicated how much they enjoyed it (0=“not at all” to 10=“very much”). After that, they answered two questions to capture downstream consequences of the experience. First, they indicated their relative preference for completing another activity that entailed either the same Snake game or a different task (0=“strongly prefer other task” to 10=“strongly prefer Snake”). Finally, they were given the opportunity to sign up, by providing their e-mail address, for free access to a (malfunction-free) version of the Snake game that they could return to in the future and play at their leisure.

**Results**

As expected, the larger malfunction was perceived to be more annoying (M=5.60) than the smaller malfunction (M=3.12; t(396)=8.88, p<.0001). An ANOVA with enjoyment of the game-playing experience as the dependent variable revealed a significant interaction among the two factors (F(1,394)=5.29, p=.02, \(\eta^2=.01\)). In the ongoing-opportunity conditions, enjoyment was significantly higher when the malfunction was larger (M=6.62) than when it was smaller (M=5.37; t(197)=2.98, p=.003), in line with the findings of Experiment 1. By contrast, and as hypothesized, when the opportunity for corrective action was only available at the beginning of the experience, there was no significant difference in enjoyment between the larger (M=6.66) and the smaller (M=6.71; t(197)=0.14, p=.89) malfunction condition.

Consistent with our theorizing, enjoyment of the experience appears to be driven by whether participants chose to take corrective action. A logistic regression analysis of whether participants addressed the malfunction also revealed a significant interaction between the two factors (\(\beta=1.78, z(394)=3.06, p=.002\)). In the ongoing-opportunity conditions, a greater proportion of participants addressed the malfunction when it was larger (91%) than when it was
smaller (56%; $\beta=-2.13$, $z(197)=5.08$, $p<.0001$). However, in the beginning-only conditions, there was no significant difference in the proportion who addressed the larger (87%) and smaller (83%; $\beta=-0.35$, $z(197)=0.86$, $p=.39$) malfunctions. Limiting the opportunity for corrective action to the beginning of the experience rendered participants who faced the smaller malfunction equally likely to take such action as those who faced the larger malfunction. Thus, either the beginning-only intervention or the presence of a severe malfunction appeared to be sufficient to motivate the vast majority of participants to take corrective action. (Although the combination of these two forces might result in an even greater inclination to address a malfunction, this was not the case here, potentially because even the smaller malfunction was sufficiently annoying to trigger corrective action when there was only a single opportunity.)

An ANOVA with preference for completing another task involving the Snake game as the dependent variable revealed a significant interaction between the two factors ($F(1,394)=5.78$, $p=.02$). In the ongoing-opportunity conditions, participants who had experienced the larger malfunction indicated a stronger preference for Snake ($M=6.89$) than those who had experienced the smaller malfunction ($M=5.20$; $t(197)=3.91$, $p=.0001$). In the beginning-only conditions, there was no significant difference in preference between the larger ($M=6.91$) and smaller ($M=6.67$; $t(197)=0.59$, $p=.55$) malfunction conditions. Finally, there was also a significant interaction between the two factors in whether participants signed up for future access to the game ($\beta=0.91$, $z(394)=2.06$, $p=.03$). In the ongoing-opportunity conditions, the proportion of participants who signed up was greater among those who had experienced the larger malfunction (45%) than among those who had experienced the smaller malfunction (25%; $\beta=-0.90$, $z(197)=2.93$, $p=.003$). In the beginning-only conditions, there was again no significant difference between the larger (42%) and smaller (43%; $\beta=0.01$, $z(197)=0.04$, $p=.97$) malfunction conditions.
Discussion

The results of Experiment 2 demonstrate that ongoing opportunities for corrective action can be a double-edged sword. On one hand, they provide consumers with the flexibility to take such action whenever they wish. On the other hand, they tempt consumers to defer the decision about whether to do so, which can lead to an inaction trap. Thus, counterintuitively, consumers may actually benefit from having fewer opportunities for corrective action, particularly in the case of minor malfunctions. Finally, measures of downstream consequences show that a smaller malfunction that is allowed to persist not only diminishes enjoyment of the consumption experience, but also has a negative impact on intention to use the product in the future.

EXPERIMENT 3

Some product malfunctions become more severe over time. The effect of malfunction escalation on consumers’ decision to take corrective action should depend on the rate of escalation. Prior work has shown that failures to act are most likely when the current opportunity for action is highly similar to a previously forgone one (van Putten, Zeelenberg, and van Dijk 2009). The more slowly a malfunction escalates, the greater the similarity among consecutive opportunities for corrective action. Thus, a lower rate of escalation might lead consumers to be willing to endure levels of malfunction severity that, if thrust into abruptly, they would address immediately. By contrast, rapid escalation of a malfunction should render consumers less likely to be affected by their prior inaction. Therefore, we predict that the inaction-trap phenomenon may also occur with malfunctions that increase in severity, such that slowly (rather than rapidly) escalating malfunctions demotivate corrective action and result in less enjoyable consumption experiences in the same way that smaller (rather than larger) constant malfunctions do.
Method

A total of 411 adult U.S. residents, recruited through Amazon Mechanical Turk, completed the study in exchange for a $2 payment. The consumption experience, malfunction, and corrective action were the same as in Experiment 2 (see the Web Appendix for screenshots). Participants were randomly assigned to one of four conditions entailing different types of product malfunctions – (1) constant smaller, (2) constant larger, (3) slow escalation, and (4) rapid escalation. Participants in the constant smaller and constant larger malfunction conditions experienced random moves, respectively, 3 and 20 times per minute. In both escalation conditions, malfunctions initially occurred 3 times per minute, and this frequency increased up to 20 times per minute, but at different rates. In the slow-escalation condition, the increase from 3 to 20 malfunctions per minute unfolded gradually over the first 300 seconds of the experience. In the rapid-escalation condition, the same increase occurred over the first 150 seconds. Once the malfunction frequency reached 20 times per minute, it stayed constant for the remainder of the experience. In all conditions, participants could take corrective action (to remove the malfunction) at any time by completing 20 rounds of the number task.

As in Experiment 2, participants previewed the Snake game (first without and then with the malfunction) and the number task. Those in the escalation conditions experienced the malfunction preview at a constant magnitude of 3 times per minute. All participants were then advised that the frequency at which malfunctions occurred might change over the course of the experience. Upon completion of the 10-minute game-playing experience, participants indicated how much they enjoyed it (0=“not at all” to 10=“very much”) and then responded to the same downstream measures as in Experiment 2.
Results

The enjoyment ratings were analyzed using a single-factor ANOVA with planned contrasts between the two constant malfunction conditions and between the two escalating malfunction conditions. The overall effect of condition was significant ($F(3,407)=6.07$, $p=.0005$, $\eta^2=.04$). In the constant malfunction conditions, enjoyment was higher when the malfunction was larger ($M=6.66$) than when it was smaller ($M=5.26$; $F(1,407)=12.69$, $p=.0004$), replicating the results of Experiment 2. In the escalating malfunction conditions, as hypothesized, enjoyment was higher when the magnitude increased rapidly ($M=6.63$) than when this escalation occurred more slowly ($M=5.74$; $F(1,407)=4.89$, $p=.03$).

In line with our theorizing, the findings regarding corrective action are consistent with those for enjoyment. In the constant malfunction conditions, more participants addressed the malfunction when it was larger (85%) than when it was smaller (52%; $\beta=-0.82$, $z(407)=4.92$, $p<.0001$). In the escalation conditions, more participants addressed the malfunction when it escalated rapidly (83%) than when it escalated slowly (59%; $\beta=-0.62$, $z(407)=3.68$, $p=.0002$).

To examine the downstream consequences of the malfunction experiences, we first ran a single-factor ANOVA with preference for completing another task involving the Snake game as the dependent variable and with planned contrasts within the constant and escalating conditions. There was a significant overall effect of condition ($F(3,407)=4.71$, $p=.003$). In the constant malfunction conditions, participants who had experienced the larger malfunction indicated a stronger preference for Snake ($M=6.37$) than those who had experienced the smaller malfunction ($M=4.99$; $F(1,407)=8.83$, $p=.003$). Moreover, those in the rapid escalation condition reported a greater preference for Snake ($M=6.52$) than those in the slower escalation condition ($M=5.56$ $F(1,407)=4.14$, $p=.04$). The second indicator of downstream consequences is whether participants signed up for future access to the game. In the constant malfunction conditions,
participants who had experienced the larger malfunction were more likely to sign up (52%) than those who had experienced the smaller malfunction (32%; $\beta=-0.82$, $z(407)=4.92$, $p<.0001$).

Finally, participants in the rapid escalation condition were more likely to sign up (50%) than those in the slower escalation condition (35%; $\beta=-0.62$, $z(407)=3.68$, $p=.0002$).

Discussion

Experiment 3 broadens the empirical support for the inaction-trap effect by showing that it also occurs for product malfunctions that increase in severity. Slowly escalating malfunctions (compared to ones that escalate more rapidly) can demotivate corrective action and consequently reduce consumption enjoyment just as minor constant malfunctions do. Interestingly, while only 15% of participants who faced the large (constant) malfunction from the outset endured it until the end of the consumption experience, this was true of 41% of those who faced the slowly escalating malfunction – which, after 300 seconds, reached the same level of severity as its large constant counterpart. Complementing the evidence on downstream consequences from Experiment 2, we find that leaving smaller or slowly escalating malfunctions unaddressed leads to significantly lower interest in future product use. This suggests that firms should be wary of allowing small malfunctions to persist. Widespread disengagement resulting from unaddressed minor problems could prove equally costly in the long run.

EXPERIMENT 4

In the experiments presented thus far, the malfunctions were intermittent in that they sporadically disrupted the consumption experience. Experiment 4 was designed to examine whether the inaction-trap effect also occurs in connection with continuous malfunctions. We predicted that, irrespective of whether malfunctions are continuous or intermittent in nature, smaller malfunctions encourage the deferral of the decision about whether to take corrective action, ultimately resulting in a less enjoyable consumption experience. Moreover, in the first
three experiments, the severity of the (intermittent) malfunctions was manipulated via the
frequency with which disruptions occurred. To further probe the generality of the inaction-trap
phenomenon in Experiment 4, the manipulation of the magnitude of the intermittent
malfunctions was based on the duration rather than the frequency of the disruptions.

Method

A total of 484 adult U.S. residents, recruited via Amazon Mechanical Turk, completed
the study in exchange for a $1.80 payment. The consumption experience entailed listening to
music for 10 minutes. Using an on-screen music player, participants could choose among 12
songs and were free to switch between songs at any time (see Web Appendix for screenshots). At
the outset, participants were forewarned that they would encounter a malfunction of the music
player in the form of audio static. They were also informed that, at any time during the music-
listening experience, they could take corrective action to get rid of the malfunction by
completing 20 rounds of the number task (see Experiments 2 and 3). In this experiment, if
participants chose to perform the number task, music continued to play while they did so.

Participants were randomly assigned to the conditions of a conceptual 2 (malfunction
magnitude: smaller vs. larger) x 2 (type of malfunction: intermittent vs. continuous) between-
subjects design in which a different manipulation of malfunction magnitude was required for the
two types of malfunction. In the intermittent conditions, bursts of audio static occurred every 32
seconds, and each of these lasted either 1 second (smaller) or 4 seconds (larger). In the
continuous conditions, the static was constantly present at either 10% (smaller) or 40% (larger)
of the music player’s volume. Upon completion of the 10-minute music-listening experience,
participants indicated how much they enjoyed it (0=“not at all” to 10=“very much”).


Results

Ratings of enjoyment of the music-listening experience were analyzed using a single-factor ANOVA with planned contrasts between the two intermittent conditions and between the two continuous conditions. The overall effect of condition was significant ($F(3,480)=14.45$, $p<.0001$, $\eta^2=.08$). In the intermittent conditions, enjoyment was significantly higher when the malfunction was larger ($M=8.47$) than when it was smaller ($M=7.12$ $F(1,480)=25.57$, $p<.0001$). Similarly, in the continuous conditions, enjoyment was also higher in the larger malfunction condition ($M=8.33$) than in the smaller malfunction condition ($M=7.20$ $F(1,480)=17.76$, $p<.0001$). Thus, the inaction-trap effect manifested for both types of product malfunctions.

The findings for corrective action align with the enjoyment results. In the intermittent conditions, a greater proportion of participants took corrective action when the malfunction was larger (92%) than when it was smaller (63%; $\beta=-0.94$, $z(480)=4.96$, $p<.0001$). This effect was paralleled in the continuous conditions where more participants took corrective action when the malfunction was larger (83%) than when it was smaller (60%; $\beta=-0.60$, $z(480)=3.94$, $p<.0001$).

Discussion

The results of Experiment 4 highlight the generality of the inaction-trap phenomenon across different types of product malfunctions. In particular, product malfunctions that take the form of continuous disruptions (of a particular magnitude) can trigger the same dynamics as malfunctions that entail intermittent disruptions (of a particular frequency or duration).

EXPERIMENT 5

The inaction-trap mechanism presumes that, compared to severe defects, smaller product malfunctions are less likely to be addressed immediately, and that subsequent opportunities for corrective action are devalued relative to previously forgone ones. Therefore, it should be possible to eliminate the paradoxical positive effect of malfunction severity on enjoyment shown
in Experiments 1-4 by preventing consumers from addressing a malfunction for a while when it is first encountered. If one had to initially endure a malfunction for some time without being able to take corrective action, there would be no basis for devaluing the (delayed) first opportunity to address the malfunction, thus averting the inaction trap (and consequently the negative impact on consumption enjoyment) in connection with smaller malfunctions. Experiment 5 was designed to test this hypothesis. A secondary objective of this experiment was to examine enjoyment at various points of the consumption experience to gain deeper insights into the hedonic consequences of the interplay between malfunction severity and corrective action.

Method

A total of 161 adult U.S. residents, recruited via Amazon Mechanical Turk, completed the study for a $1 payment. It entailed the same 10-minute music-listening experience as Experiment 4 (see the Web Appendix for details). Participants were randomly assigned to one of the conditions of a 2 (malfunction magnitude: smaller vs. larger) x 2 (opportunity for corrective action: immediate vs. delayed) between-subjects design. The smaller and larger malfunction conditions had bursts of static occurring every 32 seconds and lasting either 1 second or 4 seconds, respectively. In the immediate conditions, participants could take corrective action at any time during the music-listening experience. In the delayed conditions, the opportunity to address the malfunction only became available 150 seconds into the experience, and was continuously available thereafter. In all conditions, to correct the malfunction, a participant had to complete 20 rounds of the number task concurrent with music listening.

Throughout the experience, participants were prompted every 30 seconds to indicate how much they were enjoying the experience at that moment (0=“not at all” to 10=“very much”), with the first of these ratings occurring 20 seconds into the experience (and prior to the onset of
the first burst of static). Upon completion of the music-listening experience, participants indicated how much they enjoyed it overall (0=“not at all” to 10=“very much”).

Results

An ANOVA with overall enjoyment of the music-listening experience as the dependent variable revealed the predicted interaction among the two factors ($F(1,157)=6.33$, $p=.01$, $\eta^2=.04$; see Figure 2). In the immediate conditions, enjoyment was higher when the malfunction was larger ($M=8.38$) than when it was smaller ($M=7.51$; $t(81)=2.15$, $p=.03$). By contrast, in the delayed-opportunity conditions, there was no significant difference in enjoyment between the larger ($M=8.08$) and the smaller ($M=8.51$; $t(76)=1.37$, $p=.18$) malfunction conditions.

[Insert Figure 2 about here]

The findings regarding corrective action are in line with those for enjoyment. A logistic regression analysis of whether participants addressed the malfunction revealed a marginally significant interaction between the two factors ($\beta=-1.58$, $z(157)=1.89$, $p=.06$). In the immediate conditions, a greater proportion of participants addressed the malfunction when it was larger (83%) than when it was smaller (56%; $\beta=-1.36$, $z(81)=2.62$, $p=.009$). However, in the delayed conditions, there was no significant difference in the proportion of participants who addressed the larger (85%) and smaller (87%; $\beta=0.21$, $z(76)=0.33$, $p=.75$) malfunctions.

[Insert Figure 3 about here]

Figure 3 illustrates the dynamics of corrective action and enjoyment over the course of the music-listening experience. The top panel reveals the time course of enjoyment by condition. The bottom panel shows, for each of the four conditions, what proportion of participants had addressed the malfunction by a certain point. In the delayed conditions, irrespective of malfunction magnitude, enjoyment decreased steadily until shortly after the opportunity to address the malfunction became available, at which point it started to increase dramatically. This
coincided with a spike in corrective action in these conditions. In the immediate conditions, the patterns differed considerably by malfunction magnitude. When the malfunction was smaller, a much greater proportion of participants allowed it to persist for the entire experience, in line with the inaction-trap mechanism, and this had a detrimental impact on consumption enjoyment.

Discussion

The results of this experiment provide further evidence in support of the inaction-trap mechanism by showing that the greater detrimental impact of facing minor product malfunctions (compared to more severe defects) on consumption enjoyment hinges on the availability of ongoing opportunities for corrective action from the outset. As consumers tend not to take corrective action immediately when they encounter a small product malfunction, they forgo initial opportunities to do so, which then results in the devaluation of subsequent opportunities, ultimately trapping them in a state of inaction. According to our theorizing, the inaction-trap effect on enjoyment should not occur in the absence of initially forgone opportunities for action, relative to which subsequent ones are then devalued. The findings of Experiment 5 support this prediction. Delaying the opportunity to take corrective action, effectively forcing participants to experience the (small) malfunction for some time before they were able to address it, averted an inaction trap by preventing the devaluation of the (delayed) opportunity for action.

This experiment also highlights how the inaction-trap theory is distinct from related accounts. In particular, it makes dramatically different predictions for this setting compared to myopic biases, such as procrastination (Ariely and Wertenbroch 2002; Loewenstein 1996; Steel 2007), intertemporal discounting (Frederick, Loewenstein, and O’Donoghue 2002), or consumer lock-in (Zauberman 2003). While these accounts imply that consumers might not address a small malfunction given that the costs of doing so are immediate whereas the benefits of corrective
action accrue over time, they cannot explain why the initial unavailability of the opportunity for corrective action renders consumers more likely to address a small malfunction.

**EXPERIMENT 6**

The results of Experiment 5 demonstrate that a way to avoid inaction traps is to delay the onset of the opportunity for taking corrective action, thereby ensuring that consumers experience the malfunction for some time without being able to address it, and thus without the possibility of forgoing opportunities for corrective action. Experiment 6 examines how consumers might escape inaction traps once they have already forgone some initial opportunities for corrective action. According to our theorizing, the inertia arises because the current opportunity to act appears less attractive than previous ones. Prior work has shown that greater dissimilarity between previously forgone and current opportunities attenuates inaction inertia (van Putten, Zeelenberg, and van Dijk 2007). Thus, if the initial opportunity to address a product malfunction required a different action than the current one, consumers should be less likely to compare these opportunities, and consequently less likely to devalue the current one. Changing the means of corrective action should therefore help consumers get unstuck by encouraging them to take corrective action, ultimately enhancing their enjoyment of the overall experience.

**Method**

A total of 190 adult U.S. residents, recruited via Amazon Mechanical Turk, completed the study in exchange for a $1 payment. The consumption experience (10 minutes of listening to music), enjoyment ratings, and malfunction manipulations were the same as in Experiment 5. Participants were randomly assigned to one of the conditions of a 2 (malfunction magnitude: smaller vs. larger) x 2 (means of addressing: constant vs. changed) between-subjects design. In all conditions, corrective action entailed entering 20 specific characters. There were two versions of this task. One was identical to the number task used in Experiment 5. The other involved
entering letters into a 4x5 grid (see Web Appendix for screenshots). These versions were pre-tested to confirm that they were equally difficult and equally preferred, but still perceived as different. In all conditions, participants were randomly assigned to having one of these two versions as their means of corrective action at the outset. In the changed means conditions, the task required to address the malfunction changed to the other version 150 seconds into the music-listening experience (unless a participant had already taken corrective action).

Results

An ANOVA with overall enjoyment of the music-listening experience as the dependent variable revealed the predicted interaction among the two factors ($F(1,186)=11.79$, $p=.0007$, $\eta^2=.05$; see Figure 4). When the means of corrective action remained constant throughout the experience, enjoyment was higher when the malfunction was larger ($M=8.49$) than when it was smaller ($M=6.91$; $t(91)=4.20$, $p<.0001$). By contrast, when the means changed partway through the experience, there was no significant difference in enjoyment between the larger ($M=8.51$) and the smaller ($M=8.60$; $t(95)=0.29$, $p=.77$) malfunction conditions, in line with our theorizing.

[Insert Figure 4 about here]

The findings on corrective action align with those for enjoyment. When the means of addressing the malfunction remained constant, a significantly greater proportion of participants corrected the malfunction when it was larger (85%) than when it was smaller (48%; $\beta=-1.83$, $z(91)=3.62$, $p=.009$). By contrast, when the means of corrective action changed during the experience, there was no significant difference in the proportion of participants who addressed the larger (87%) and smaller (78%; $\beta=-0.66$, $z(95)=1.18$, $p=.24$) malfunction.

Figure 5 illustrates the dynamics of corrective action and enjoyment over the course of the experience. The top panel indicates, for each of the four conditions, the time course of enjoyment. The bottom panel shows what proportion of participants had taken corrective action
by a certain point. In the smaller malfunction conditions, enjoyment initially decreased somewhat, and then either continued to decline if the means of addressing the malfunction remained the same or rebounded if the means changed. This aligns with the decisions to take corrective action, which increased dramatically in the changed-means condition once the change had occurred. By comparison, in the larger-malfunction conditions, participants tended to address the malfunction early on, resulting in high levels of enjoyment, irrespective of whether the means of corrective action changed.

[Insert Figure 5 about here]

**Discussion**

As hypothesized, a change in the means of addressing a malfunction disrupts the dynamics of the inaction-trap mechanism by reducing the comparability of the post-change opportunity for correction action to previously forgone ones. The process evidence obtained in Experiment 6 shows that many participants in the smaller malfunction condition who had not yet addressed the malfunction did so shortly after the change in means occurred. Around the same time, the two smaller malfunction conditions began to diverge in terms of enjoyment.

**EXPERIMENT 7**

While the results of Experiments 1-6 are consistent with the hypothesis that the forgoing of opportunities for corrective action causes the devaluation of subsequent opportunities, they do not provide direct evidence of this mechanism. Experiment 7 was designed to fill this gap by using a paradigm that allows the measurement of how much people value an opportunity to take corrective action as a function of whether they have previously forgone such opportunities, and to do so in a way that is free of contamination due to selection bias. Thus, participants had to be randomly assigned to either have or have not elected to forgo opportunities for corrective action
prior to a focal opportunity, the valuation of which was to be quantified. Based on our theorizing, we hypothesized that the focal opportunity would be valued less after forgoing prior ones.

*Method*

A total of 248 adult U.S. or Canadian residents, recruited through Amazon Mechanical Turk, completed the study in exchange for a $1.50 payment. It entailed the same music-listening experience as Experiments 4-6. All participants faced the smaller continuous malfunction from Experiment 4. They were randomly assigned to one of the conditions of a single-factor (forgone opportunities: no vs. yes) between-subjects design.

To set the stage for the focal task, all participants first completed a hypothetical shopping task for three small appliances. For each appliance, they viewed a product description and indicated the maximum amount they were willing to pay for it (see the Web Appendix for screenshots). After that, the appliance’s price was revealed, and if the participant’s willingness to pay (WTP) was greater than or equal to that price, they were told they had (hypothetically) bought the item for the revealed price. The purpose of this task was to train participants on articulating their WTP for something that had a price that was initially unknown to them.

Next, participants were informed that they received a surprise bonus of $0.50, of which they could spend a portion to correct the malfunction they would encounter in the upcoming music-listening experience. They were told that they would have a total of five opportunities to do so. Any unspent portion was paid to them in addition to their base payment.

In both conditions, the focal opportunity for corrective action occurred 150 seconds into the music-listening experience, where participants stated what they would be willing to pay to have the malfunction corrected at that point. In the no-forgone-opportunity condition, the focal opportunity for corrective action was the first one that participants encountered. By contrast, in the forgone-opportunity condition, they had two prior opportunities, one 50 and the other 100
seconds into the experience, to remove the malfunction in exchange for $0.25. This cost was pretested to be high enough to deter most participants from taking the opportunity but low enough for them to consider it and, thus, feel that they were choosing to forgo it. We expected that most participants in the forgone-opportunity condition would not be willing to pay $0.25 at these first opportunities for corrective action and, as a result, arrive at the focal opportunity having forgone two previous ones.

At the focal opportunity for corrective action, participants in both conditions were asked to indicate their WTP for having the malfunction removed. They did so by submitting a bid between $0.01 and $0.50. Before doing so, participants were informed that a random price would be drawn and that if their stated WTP was higher than or equal to it, they would pay the drawn price to have the malfunction corrected. This procedure incentivized participants to truthfully reveal their valuation (Becker, DeGroot, and Marschak 1964) of the opportunity. (After submitting their bid, they were informed that the drawn price was $0.01 and then completed the remainder of the listening experience without malfunction.)

Results

Only one participant in the forgone-opportunity condition chose to pay $0.25 to correct the malfunction prior to the focal opportunity. We imputed a WTP of $0.25 for them. In line with our theorizing, the WTP for having the malfunction corrected was significantly lower in the forgone-opportunity condition ($M=$0.02) than in the condition where the focal opportunity was the first one encountered ($M=$0.04; $t(246)=2.47, p=.01, d=.30$). There was no significant difference between conditions in overall enjoyment ($t(246)=1.61, p=.10$).

Discussion

The findings of Experiment 7 provide direct evidence of the devaluation mechanism, showing that forgoing opportunities for corrective action results in lower valuations of
subsequent opportunities. This deepens our understanding of the dynamics that cause inaction traps in consumer response to product malfunctions.

**EXPERIMENT 8**

The objective of Experiment 8 was to probe the generalizability of the devaluation mechanism by seeking evidence of it in two additional product-malfunction contexts using a scenario approach.

**Method**

A total of 240 adult U.S. or Canadian residents, recruited through Amazon Mechanical Turk, completed the study in exchange for a $0.50 payment. They were randomly assigned to one of the conditions of a 2 (forgone opportunity: no vs. yes) x 2 (product: car vs. smartphone) between-subjects design. After reading a scenario describing a minor malfunction of their car or smartphone for which they either did or did not have a prior opportunity for corrective action that they chose to forgo (see Web Appendix for scenarios), participants were asked what they would be willing to pay to have the malfunction corrected at that point.

**Results**

An ANOVA with valuation of the opportunity to address the product malfunction as the dependent variable revealed a main effect of whether there had been a prior opportunity. WTP for having the malfunction addressed was significantly lower in the forgone-opportunity condition ($M=$43) than in the no-forgone-opportunity condition ($M=$55; $F(1,236)=10.42, p=.001, d=0.42$), in line with our theorizing. Neither the main effect of product ($F(1,236)=0.004, p=.95$) nor the interaction among the two factors ($F(1,236)=0.03, p=.87$) was significant.

**Discussion**

The results of Experiment 8 provide additional direct evidence that the forgoing of an earlier opportunity to address a product malfunction causes the devaluation of a subsequent
opportunities to do so. These findings also highlight the robustness of this devaluation mechanism by demonstrating it in connection with two common consumer products.

CONSUMER SURVEY

To complement our body of experimental evidence demonstrating the proposed inaction-trap mechanism, we conducted a survey in which consumers described real product malfunctions they had experienced. The objective of this survey was to examine how common this phenomenon is in the wild. Our key hypothesis was that instances where consumers experience greater suffering as a result of less severe product malfunctions than they do from more severe ones occur with regularity, rather than being the exception.

Method

A total of 291 adult U.S. residents (127 females, mean age: 34.4), recruited via Amazon Mechanical Turk, completed the survey in exchange for a $1.50 payment. Participants were asked to describe four product malfunctions that they had experienced in the past, but that were no longer active (see the Web Appendix for screenshots). They were instructed to only include malfunctions that did not render a product completely unusable. For each of these malfunctions, participants then rated its severity in terms of the extent to which it interfered with the product’s normal function (0=“hardly at all” to 10=“very much”)

\[2\]

its total duration (in days), the total amount of suffering it caused them (0=“very little” to 10=“a lot”), and how the experience affected their attitude towards the brand (-3=“much more negative attitude” to +3=“much more positive attitude”). After that, participants ranked the four malfunctions in terms of the total amount of suffering they caused. Finally, they provided basic demographic information.

\[2\] For all rating-scale measures used in the survey, the actual response scales only included verbal end-point labels (and no numeric values). The numbers reported here merely reflect how responses were coded for analysis.
Results

Participants described malfunctions from 15 different product categories including small appliances, vehicles, clothing, and toys. The mean malfunction severity was 7.7. The mean duration was 68 days. A mixed-effects regression model (with a random intercept for participant) revealed the expected positive effects of malfunction severity ($\beta=.50, \, t(871)=18.09, \, p<.0001$) and (log-transformed) malfunction duration ($\beta=.17, \, t(871)=4.52, \, p<.0001$) on total suffering. There was no significant interaction between severity and duration ($t(870)=1.11, \, p=.27$).

To test our key hypothesis, we sought evidence of within-consumer “reversals” between the severity of the four malfunctions and the ranking of these malfunctions in terms of the total amount of suffering they caused. Every instance where a less severe malfunction resulted in greater suffering than a more severe one constituted a reversal. The majority of participant records (65%) contained at least one such reversal. We classified reversals in terms of the number of rank positions of suffering by which the smaller malfunction exceeded the larger one. For example, if the malfunction that caused the greatest suffering was less severe than the one that caused the second greatest suffering, this was coded as a first-order reversal. If it was less severe than the malfunction that caused the third greatest suffering, this was coded as a second-order reversal, and if it was less severe than the malfunction that caused the least suffering among the four, this was coded as a third-order reversal. By this classification, 50% of the observed reversals were first-order, 23% were second-order, and 27% were third-order (see Figure 6). Across all observed reversals, the less severe malfunction, which caused greater suffering, was allowed to persist almost twice as long ($M=95.8$ days) as the more severe one ($M=51.3$ days; $t(224)=2.74, \, p=.007$), in line with the inaction-trap mechanism.

[Insert Figure 6 about here]
Finally, to examine the downstream consequences of experiencing product malfunctions, we ran a mixed-effects regression model (with a random intercept for participant) with changes in brand attitude as the dependent variable, and with malfunction severity, the (log-transformed) duration of the malfunction, and total suffering caused as independent variables. Severity had a significant effect on changes in brand attitude such that larger malfunctions resulted in greater reductions in brand attitude ($b=-.07, t(870)=-4.53, p<.0001$). Similarly, total suffering also reduced brand attitude ($b=-.08, t(870)=-5.98, p<.0001$). The effect of duration was not significant ($b=-.03, t(870)=-1.67, p=.10$). To examine the relative importance of severity and suffering, we ran two separate mixed-effects regression models with each of these as the only independent variable. Based on the conditional $R^2$ values of these models, total suffering ($R^2=.270$) is a stronger predictor of changes in brand attitude than malfunction severity ($R^2=.263$).

Discussion

Consistent with our experimental findings, the majority of consumers who participated in this survey reported at least one smaller malfunction that caused them greater suffering than one or more larger malfunctions that they also encountered. The significantly longer average duration of the smaller malfunction in these reversals suggests that, consistent with our theorizing, less severe malfunctions can produce greater suffering because they are often allowed to persist longer. These findings indicate that smaller product malfunctions routinely lead to greater suffering for the majority of consumers. The results of this consumer survey also suggest that, in addition to the (unsurprisingly) greater negative impact of more severe product malfunctions on brand attitudes, smaller malfunctions that consumers endure for a long time – and thus cause more total suffering – can have even greater detrimental consequences for firms and their brands.
GENERAL DISCUSSION

This research identifies a phenomenon, inaction traps, which can lead consumers to suffer more from relatively less severe issues because of the way they make decisions to address or endure these issues. Minor product malfunctions are particularly likely to produce inaction traps because consumers often defer the decision of whether to take corrective action and find subsequent opportunities to take such action relatively less attractive. Similar inaction traps may arise in a host of other settings where individuals often defer the initial decision about whether to act and where subsequent opportunities appear inferior to those that are initially forgone.

Indeed, the findings presented here might offer insight into failures to take action in a wide variety of domains. For instance, people may face similar challenges in deciding whether to seek medical attention for a relatively minor health issue, potentially leading to greater suffering or the escalation of the problem into something much more serious. Other domains where a failure to act in response to problematic, but not catastrophic, developments could result in inaction traps are human resource management (e.g., retaining an employee who is marginal, but not awful) and financial investing (e.g., holding on to a stock that has been performing somewhat poorly, but not terribly).

By examining these inaction traps, the current research highlights the dual nature of many aspects of the decision to take action to remedy a problem. More severe problems can cause greater harm in the moment, but are also likely to be addressed quickly. Having more opportunities for action increases the window in which to act while reducing the importance of each opportunity. Being initially deprived of the opportunity for action prevents us from acting quickly, but may increase the chance that we act at all. These relationships reveal the complexity of what, on the surface, appear to be relatively straightforward choices – demonstrating the
dependence of each decision to act on not only current conditions, but also the opportunities, past and future, that the current opportunity is weighed against.

Just as we can perceive a candle as bright in darkened room or feel poorer when a colleague gets a raise, we may view a promising course of action as undesirable relative to prior missed chances, or opportunities that we believe are around the corner. We struggle to judge the absolute utility of specific opportunities for action. However, we are better able to evaluate a given opportunity when we compare it to other (past or future) opportunities. By doing so, we give context to otherwise isolated decisions. These relative evaluations may serve us well in most situations, facilitating fast and reasonably accurate choices. However, our desire for something to compare an opportunity to can also contribute to inaction. We have difficulty letting go of opportunities that are no longer available and shifting our attention to the benefits that can still be gained.

The present work extends prior findings on inaction inertia in that it expands the conceptualization of inertia to include the initial inaction. Prior work has taken initial inaction as given and examined how it influences subsequent choices. By extending our frame of analysis, we contribute to a broader understanding of the conditions that produce inaction initially and a richer analysis of not only if, but when, decision makers take subsequent opportunities for action. In addition, by examining how these decisions affect consumption experience, this research advances our understanding of the consequences of consumer inaction.

Table 1 provides an overview of the experiments reported in this article – in terms of their purpose and unique contribution, their design, and their key results, demonstrating inaction traps across several different malfunction types (continuous, intermittent, escalating), forms of severity (frequency of disruption, intensity of disruption, duration of disruption), and means of corrective action (loss of functionality, monetary cost, effortful task). In addition to the
enjoyment results by condition for Experiments 1-6, the table also includes a breakdown of these results based on whether corrective action was taken. We report these conditional enjoyment results merely in the interest of transparency — they must be interpreted with caution because, unlike the results presented throughout this article, they entail comparisons between groups that participants self-selected into (rather than experimental conditions that they were randomly assigned to) and thus cannot be used to infer causality.

We conducted a Single-Paper Meta-Analysis (SPM) (McShane and Böckenholt 2017) on experiments 1-6 examining the effect of malfunction magnitude on enjoyment when malfunction magnitude was constant, the opportunity for corrective action was ongoing, and the means of corrective action was constant. An SPM of our studies estimates the effect at .63 (95% CI: .57–.70). $I^2$ was estimated at 92% (95% CI: 88%–95%), suggesting that heterogeneity is very high. This heterogeneity might be partly due to the qualitatively different consumption experiences used in the various experiments. Baseline enjoyment likely varies between the video watching, music listening, and game playing tasks. As an exploratory analysis, we conducted another SPM accounting for experience type (video, music, game). In this SPM (see Figure 7), the estimate of $I^2$ dropped to 0% (95% CI: 0%–25%), which suggests that experience type is driving the high heterogeneity. The effect estimate in this second analysis was .64 (95% CI: .54–.74). While the estimate of the effect is very similar, the heterogeneity is now substantially smaller.

The body of evidence presented here shows that smaller product malfunctions that are allowed to persist can have a significant detrimental impact not only on consumption experience, but also on downstream brand attitudes and interest in future engagement with a particular
product. Inaction traps present a major challenge for firms in that they can cause significant harm to brands and may be difficult to detect.

The rapid proliferation of products that are connected to the internet creates opportunities for manufacturers to detect, and even address, malfunctions before they significantly impact consumers. For unconnected products, the best options may be subtle interventions, in line with behavioral “nudges” (Thaler and Sunstein 2008), such as scheduling regular maintenance by default with consumers opting out if they so choose. Product warranties that pre-commit consumers to addressing malfunctions may also be helpful.

But what about the consumers who find themselves in an inaction trap? Taking advantage of a good opportunity after seemingly superior opportunities have been missed requires a shift in attention. Consumers might be able to spur themselves to action by focusing on the benefits still to be gained rather than those that were lost as a result of the initial deferral. Similar framing effects have been demonstrated in prior research (Tykocinski, Pittman, and Tuttle 1995) and could be effective here as well. Work on inaction inertia in buying decisions has shown that the addition of a new alternative to the choice set can help overcome inertia (Tsiros 2009). After an extended period of inaction, consumers might more easily overcome inaction through product replacement by selecting a previously unavailable alternative.

The inaction-trap model predicts novel interventions that do not follow from related theories, such as initially preventing corrective action or changing the means of corrective action. Alternative accounts based on an underweighting of the long-term consequences of choices including melioration (Herrnstein et al. 1993; Herrnstein and Vaughan 1980), hyperbolic discounting (Frederick, Loewenstein, and O’Donoghue 2002), and consumer lock-in (Zauberman 2003) suggest that consumers could suffer disproportionately from smaller malfunctions. However, these theories cannot explain why consumers are more likely to address a malfunction
when the opportunity for corrective action was initially unavailable, or when a different, but no less costly means of correcting it becomes available at a later time.

Consumers may reflexively refrain from addressing smaller problems immediately so that they do not spend all their time addressing problems rather than enjoying consumption experiences. However, despite the well-known self-help advice to not “sweat the small stuff” (Carlson 1997), our findings suggest that consumers might be paying too little attention to minor problems, allowing these problems to persist too long, and suffering disproportionately from them as a result.
REFERENCES


Carlson, Richard (1997), Don’t Sweat the Small Stuff and It’s All Small Stuff: Simple Ways to Keep the Little Things from Taking Over Your Life, Hyperion.


## Table 1: Overview of Experiments

<table>
<thead>
<tr>
<th>Experiment 1</th>
<th>Video watching with more or less frequent audio static</th>
<th>1 minute of no audio.</th>
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<tbody>
<tr>
<td>Condition</td>
<td>Malfunction Magnitude</td>
<td>Time Before Correcting</td>
</tr>
<tr>
<td>Larger Malfunction</td>
<td>Every 7.5s</td>
<td>8s</td>
</tr>
<tr>
<td>Smaller Malfunction</td>
<td>Every 30s</td>
<td>26s</td>
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<th>Experiment 2</th>
<th>Snake Game with more or less frequent random moves. Correct at any time or only at beginning of experience.</th>
</tr>
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<tbody>
<tr>
<td>Condition</td>
<td>Effortful task outside of consumption experience: Enter 20 single-digit numbers before returning to game.</td>
</tr>
<tr>
<td>Ongoing</td>
<td>Larger Malfunction</td>
</tr>
<tr>
<td>Smaller Malfunction</td>
<td>Every 20s</td>
</tr>
</tbody>
</table>

| Beginning Only | Larger Malfunction | Every 3s | 0s | 0 | 94 | 87% | 5.2 | 6.9 | 6.7 | 2.5 |
| Smaller Malfunction | Every 20s | 0s | 0 | 105 | 83% | 7.2 | 6.6 | 6.7 | 2.8 |

<table>
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<tr>
<th>Experiment 3</th>
<th>Snake Game with more or less frequent random moves. Frequency is either constant or escalates.</th>
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<tr>
<td>Condition</td>
<td>Effortful task outside of consumption experience: Enter 20 single-digit numbers before returning to game.</td>
</tr>
<tr>
<td>Constant</td>
<td>Larger Malfunction</td>
</tr>
<tr>
<td>Smaller Malfunction</td>
<td>Every 20s</td>
</tr>
</tbody>
</table>

| Escalating Rapid Escalation | Over 150s | 138s | 13 | 103 | 83% | 4.7 | 7.0 | 6.6 | 2.8 |
| Slow Escalation | Over 300s | 214s | 16.2 | 96 | 59% | 4 | 6.9 | 5.7 | 3.1 |

<table>
<thead>
<tr>
<th>Experiment 4</th>
<th>Music listening with longer or shorter intermittent static bursts, or louder or quieter continuous static.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>Effortful task during consumption experience: Enter 20 single-digit numbers while music listening continues.</td>
</tr>
<tr>
<td>Intermittent</td>
<td>Larger Malfunction</td>
</tr>
<tr>
<td>Smaller Malfunction</td>
<td>1s Every 32s</td>
</tr>
</tbody>
</table>

<p>| Continuous Larger Malfunction | 40% Volume | 24s | N/A | 120 | 92% | 7.3 | 8.4 | 8.3 | 1.8 |
| Smaller Malfunction | 10% Volume | 20s | N/A | 120 | 63% | 5.7 | 8.1 | 7.2 | 2.5 |</p>
<table>
<thead>
<tr>
<th>Experiment 5</th>
<th>Cost of Corrective Action</th>
<th>Condition</th>
<th>Malfunction Magnitude</th>
<th>Time Before Correcting</th>
<th>Malfunction Instances Before Correcting</th>
<th>N</th>
<th>% Taking Corrective Action</th>
<th>Enjoyment (Not Corrected)</th>
<th>Enjoyment (Corrected)</th>
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<th>Significance and Effect Size</th>
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<tbody>
<tr>
<td><strong>Music listening with longer or shorter intermittent static bursts. Correct at any time from beginning or only after 150s.</strong></td>
<td>Immediate Opportunity</td>
<td>Larger Malfunction</td>
<td>4s Every 32s</td>
<td>60s</td>
<td>1.9</td>
<td>42</td>
<td>83%</td>
<td>8</td>
<td>8.5</td>
<td>8.4</td>
<td>1.7</td>
<td>( F(1,157)=6.33, ) ( p=.01, ) ( \eta^2=.04 )</td>
</tr>
<tr>
<td></td>
<td>Smaller Malfunction</td>
<td>1s Every 32s</td>
<td>87s</td>
<td>2.7</td>
<td>41</td>
<td>56%</td>
<td>7</td>
<td>7.9</td>
<td>7.5</td>
<td>1.9</td>
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<td></td>
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<tr>
<td><strong>Delayed Opportunity</strong></td>
<td>Larger Malfunction</td>
<td>4s Every 32s</td>
<td>159s</td>
<td>5.0</td>
<td>39</td>
<td>85%</td>
<td>6.8</td>
<td>8.3</td>
<td>8.1</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smaller Malfunction</td>
<td>1s Every 32s</td>
<td>162s</td>
<td>5.1</td>
<td>39</td>
<td>87%</td>
<td>8.8</td>
<td>8.5</td>
<td>8.5</td>
<td>1.4</td>
<td></td>
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<thead>
<tr>
<th>Experiment 6</th>
<th>Cost of Corrective Action</th>
<th>Condition</th>
<th>Malfunction Magnitude</th>
<th>Forgone Opportunities</th>
<th>N</th>
<th>WTP</th>
<th>Enjoyment</th>
<th>sd</th>
<th>Significance and Effect Size</th>
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<tbody>
<tr>
<td><strong>Music listening with longer or shorter intermittent static bursts. Means of addressing is constant or changes after 150s.</strong></td>
<td>Immediate Opportunity</td>
<td>Larger Malfunction</td>
<td>4s Every 32s</td>
<td>81s</td>
<td>2.5</td>
<td>47</td>
<td>85%</td>
<td>9.1</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td>Smaller Malfunction</td>
<td>1s Every 32s</td>
<td>51s</td>
<td>1.6</td>
<td>46</td>
<td>48%</td>
<td>7</td>
<td>6.8</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Changing Means</strong></td>
<td>Larger Malfunction</td>
<td>4s Every 32s</td>
<td>72s</td>
<td>2.3</td>
<td>47</td>
<td>87%</td>
<td>7.7</td>
<td>8.6</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>Smaller Malfunction</td>
<td>1s Every 32s</td>
<td>119s</td>
<td>3.7</td>
<td>50</td>
<td>78%</td>
<td>8.9</td>
<td>8.5</td>
<td>8.6</td>
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</table>

<table>
<thead>
<tr>
<th>Experiment 7</th>
<th>Cost of Corrective Action</th>
<th>Condition</th>
<th>Malfunction Magnitude</th>
<th>Forgone Opportunities</th>
<th>N</th>
<th>WTP</th>
<th>Enjoyment</th>
<th>sd</th>
<th>Significance and Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Music listening with continuous audio static</strong></td>
<td>Forgone Opportunity</td>
<td>10% Volume</td>
<td>2</td>
<td>130</td>
<td>2.45¢</td>
<td>8.2</td>
<td>2.2</td>
<td>( t(246)=2.47, ) ( p=.01, ) ( d=0.30 )</td>
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<tr>
<td></td>
<td>No Forgone Opportunity</td>
<td>10% Volume</td>
<td>0</td>
<td>118</td>
<td>$4.48¢</td>
<td>7.7</td>
<td>2.4</td>
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<table>
<thead>
<tr>
<th>Experiment 8</th>
<th>Cost of Corrective Action</th>
<th>Condition</th>
<th>Malfunction Magnitude</th>
<th>Forgone Opportunities</th>
<th>N</th>
<th>WTP</th>
<th>Enjoyment</th>
<th>sd</th>
<th>Significance and Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product malfunction scenario</strong></td>
<td>Forgone Opportunity</td>
<td>Minor Issue</td>
<td>1</td>
<td>122</td>
<td>$42.7</td>
<td>N/A</td>
<td>23.3</td>
<td>( F(1,236)=10.42, ) ( p=.001, ) ( d=0.42 )</td>
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<tr>
<td></td>
<td>No Forgone Opportunity</td>
<td>Minor Issue</td>
<td>0</td>
<td>118</td>
<td>$55.1</td>
<td>N/A</td>
<td>34.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FIGURE 1:

TIME OF CORRECTIVE ACTION BY MALFUNCTION MAGNITUDE (EXPERIMENT 1)
FIGURE 2:
OVERALL ENJOYMENT OF EXPERIENCE BY MALFUNCTION MAGNITUDE AND TIMING OF OPPORTUNITY TO ADDRESS (EXPERIMENT 5)

Enjoyment (0-10)

Immediate Delayed

Timing of Opportunity to Address

Interaction Effect: \( p = .01 \)
**FIGURE 3:**

TIME OF CORRECTIVE ACTION AND MOMENT-BY-MOMENT ENJOYMENT

BY MALFUNCTION MAGNITUDE AND TIMING OF OPPORTUNITY TO ADDRESS

(EXPERIMENT 5)
FIGURE 4:
OVERALL ENJOYMENT BY MALFUNCTION MAGNITUDE
AND CONTINUITY IN MEANS OF ADDRESSING (EXPERIMENT 6)

Interaction Effect: $p=.0007$
FIGURE 5:
TIME OF CORRECTIVE ACTION AND MOMENT-BY-MOMENT ENJOYMENT BY MALFUNCTION MAGNITUDE AND CONTINUITY IN MEANS OF ADDRESSING
(EXPERIMENT 6)

Enjoyment

Proportion Addressed
FIGURE 6:
REVERSALS BETWEEN MALFUNCTION SEVERITY AND TOTAL AMOUNT OF SUFFERING CAUSED (CONSUMER SURVEY)

Proportion of Consumers Having Experienced Reversals

Yes: 65%
No: 35%

Type of Reversal

1st-Order: 33%
2nd-Order: 14%
3rd-Order: 18%
FIGURE 7:

SINGLE-PAPER META-ANALYSIS OF THE EFFECT OF NON-ESCALATING MALFUNCTION MAGNITUDE ON ENJOYMENT WITH ONGOING OPPORTUNITIES FOR CORRECTIVE ACTION AND CONSTANT MEANS OF CORRECTIVE ACTION