UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL

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THE UPGRADE PARADOX:
ARE BETTER PRODUCTS BAD FOR CONSUMERS?

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Tese de Doutorado apresentada ao Programa de Pós-graduação em Administração, da Universidade Federal do Rio Grande do Sul, como exigência parcial para obtenção do grau de Doutora em Administração.

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Tese de Doutorado aprovada para obtenção do grau de Doutora no Programa de Pós-graduação em Administração da Universidade Federal do Rio Grande do Sul pela banca examinadora formada por:

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RESUMO

Este trabalho investiga como o lançamento de upgrades influencia o bem-estar dos consumidores. Especificamente, explora como a exposição dos consumidores aos upgrades determina sua trajetória hedônica com a versão dos produtos que possuem (status quo). Através de uma análise de sentimento de tweets sobre iPhones, uma pesquisa com proprietários de iPhone e sete experimentos empregando uma variedade de estímulos, os resultados apoiam a conclusão de que consumidores expostos aos upgrades apresentam um declínio hedônico mais acelerado com o status quo do que aqueles não expostos aos upgrades. Os resultados também fornecem evidências por meio de moderação e de mediação de que o declínio hedônico dos consumidores acelera porque sua atenção se desloca do status quo para o upgrade. Esses resultados chamam atenção para o potencial dano do lançamento de novas versões para o bem-estar dos consumidores. Embora os lançamentos de atualização impliquem a oferta de produtos melhores, a exposição dos consumidores a upgrades os leva a sofrer um declínio hedônico mais acelerado para a versão do produto que possuem.

Palavras-chave: Declínio hedônico; Upgrade; Enjoyment.

ABSTRACT

This work investigates how the release of upgrades influences consumers' well-being. Specifically, it explores how the exposure of consumers to upgrades determine their hedonic trajectory with products they currently own (i.e., the status quo). Across a sentiment analysis of tweets about iPhones, a survey with iPhone owners, and seven experiments employing a variety of stimuli, findings support the conclusion that consumers exposed to upgrades experience a faster hedonic decline with their status quo than those not exposed to upgrades. Results also provide moderation-based and mediation-based evidence that consumers' hedonic decline accelerates because their locus of attention moves from the status quo to the upgrade. Taken together, these findings shed light on the potential harm of upgrade releases on consumers' well-being. Although upgrade releases imply the offer of better products, the exposure of consumers to upgrades leads them to experience a faster hedonic decline for the product version they currently own.

Keywords: Hedonic decline; Upgrade; Enjoyment; Attention.

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INTRODUCTION

Year after year, companies flood the market with enhanced versions of their products. This action triggers different responses. Several consumers engage with the brand by, for instance, queueing in front of Apple stores or signing up for the Chanel nail polish waiting list. Others, however, express concern and dissatisfaction with products they already own. As an example, searches in Google for "iPhone slow" exponentially increase when Apple launches a new model (MULLAINATHAN, 2014). Regardless of the reiterated claims from the company that it does not intentionally shorten the life of devices, consumers keep perceiving the performance of their phones as worse than it was before the upgrade release (THE SUN, 2019).

An explanation for this complaining behavior could be that the mere knowledge of an enhanced version of a product reduces consumers' enjoyment with the currently owned version of that product (i.e., the status quo). Recent research has explored the effects of new-product introduction on consumers' reactions. Bellezza, Ackerman, and Gino (2017), for example, examined the potential for consumers being careless with current possessions in the presence of appealing product upgrades. Because "accidentally" damaging a product allows consumers to upgrade without appearing wasteful, the authors suggest that careless tendencies help consumers to justify their new purchases. Further, Sela and LeBoeuf (2017) showed that consumers do not make spontaneous comparisons between the upgrade and the status quo when making replacement decisions. In this context, the upgrade seems focal, and thus in need of evaluation, and the status quo seems nonfocal or a given. In other words, in a replacement decision, the locus of attention moves from the status quo to the upgrade. We state that this shift in the target of attention influences consumers' enjoyment with their status quo.

Past research shows that paying high attention to a pleasant experience extends its enjoyment over time by slowing down hedonic decline (WILSON; GILBERT, 2008). Hedonic decline is the process whereby ongoing ownership and repeated usage leads to a decreased hedonic response in the form of less desire and less ongoing enjoyment (GALAK; REDDEN, 2018). With rare exceptions (e.g., CROLIC; JANISZEWSKI, 2016), this phenomenon pervades most consumption activities. Although the ubiquity of hedonic decline, its rate is accelerated or slowed according to the consumption context (BHARGAVE; MONTGOMERY; REDDEN, 2018), consumers' expectations (SEVILLA; ZHANG; KAHN, 2016), and product properties (HAWS; MCFERRAN; REDDEN, 2017).

Past research shows that the higher the level of attention to an experience, the slower the hedonic decline for that experience (WILSON; GILBERT, 2008) and that the exposure to upgrades moves the locus of attention from the status quo to the upgrade (SELA; LEBOEUF, 2017). Therefore, we propose that consumers exposed to upgrades will pay less attention to the status quo and, consequently, will experience a faster hedonic decline to the status quo than those not exposed to upgrades.

To test our proposition, we ran a series of nine studies. The first study investigated the influence of exposure to upgrades on hedonic decline with field data on consumers' tweets about iPhones. Study 2 provided evidence from a real consumption setting that users report a lower level of enjoyment with their status quo after the introduction of a new version. Study 3 provided, through a three-week experiment, initial evidence that consumers experience an accelerated hedonic decline for the status quo when exposed to upgrades. Studies 4 and 5 replicated findings from Study 3 and, complementarily, show that consumers exposed to upgrades are more likely to replace. Studies 6 and 7 investigated the role of attention to the status quo as the underlying mechanism for the influence of exposure to the upgrade on hedonic decline through moderation (Study 6) and mediation (Study 7). Studies 8 and 9 generalized our findings to different consumption settings and ruled out attention to the number of repetitions (Study 8) and increasing aspirations (Study 9) as alternative explanations for our proposition.

This manuscript is structured as follows. First, we review the literature that provides support for our proposition. Next, we report the results of the nine studies, followed by a discussion of our contributions to both theory and practice.

THEORETICAL BACKGROUND

UPGRADE DECISIONS

The long-term ownership of a durable product often involves decisions on its replacement, which is the substitution of a good for an enhanced version in the same category (i.e., the upgrade) (SELA; LEBOEUF, 2017). In comparison to regular purchases, replacement decisions have some unique properties. As an example, this kind of decision is hindered by the psychological costs associated with the purchase price spent on the status quo (OKADA, 2001). Further, when making replacement decisions consumers need to reason about two interrelated decisions: acquire a new product and dispose an old one (ROSTER; RICHINS, 2009).

Recent research has explored the effects of new-product introduction on consumer behavior. Bellezza et al. (2017) examined the potential for consumers being careless with current possessions in the presence of appealing product upgrades. They found that "accidentally" damaging a product or running out of it quickly allows consumers to write off the residual value of the product and replace it without recording a loss or appearing wasteful. This suggests that careless tendencies are intended to promote the acquisition of upgrades by helping consumers justify their new purchases. Though consumers could simply wait for the products they own to degrade or deplete over time, knowledge about the presence of a desired upgrade makes waiting less appealing. Hence, consumers who are interested in upgrading are more likely to act carelessly with their current belongings to pass from a less justifiable to a more justifiable replacement.

Complementarily, Shani, Danziger, and Shachar (2020) examined whether consumers may "accidentally" endanger a product they own when a new version is introduced. They showed that endangering occurs when the new product offers an improved design but does not offer a significant technological improvement. That occurs because owners find a replacement for technological reasons more justifiable than one for design reasons. Owners endanger their products unconsciously hoping that they will be fortuitously damaged, providing a good reason to upgrade.

Further, Sela and LeBoeuf (2017) investigated the comparison neglect effect. According to them, people do not make spontaneous comparisons between the upgrade and the status quo. They show that, when making replacement decisions, consumers consider the upgrade features in isolation. That occurs because consumers' perception of a transaction as a product upgrade may change the decision process, making one of the options (i.e., the upgrade) seem focal and

thus in need of evaluation, and the other option (i.e., the status quo) seem non-focal. Prompting comparisons tends to decrease upgrade likelihood when consumers are reasonably satisfied with the status quo. The downstream consequence of the comparison neglect is that consumers frequently buy upgrades they would not have bought had they made the comparison.

In sum, past research demonstrates that the exposure of consumers to upgrades influences how much they care about (BELLEZZA et al., 2017; SHANI et al. 2020) and their level of attention to (SELA; LEBOEUF, 2017) the status quo. Relying on these findings, we suggest that the exposure of consumers to upgrades influences the level of enjoyment they get from the status quo. To understand this phenomenon, we review the literature on hedonic decline in the following paragraphs.

HEDONIC DECLINE

Hedonic decline is the process whereby ongoing ownership and repeated usage leads to a decreased hedonic response in the form of less desire and less ongoing enjoyment (GALAK; REDDEN, 2018). The term hedonic decline encompasses constructs such as satiation, hedonic adaptation, and habituation. A solid research stream sustains that, although it is partially physiologically determined, this is a malleable process with a significant psychological component. In other words, hedonic decline is not a function only of the amount consumed, instead, it is constructed at the moment of consumption under the influence of a myriad of factors.

Redden and Haws (2013) showed that people unconsciously manage their hedonic decline according to the desirability of the stimulus consumed. Those higher in the trait self-control satiate faster on unhealthy foods than on healthy foods. Further, Sevilla et al. (2016) found that anticipating future variety leads participants to satiate at a slower rate in the present. That occurs because anticipated variety induces positive thoughts about the experience. Such positive thoughts influence the level of enjoyment with the product currently consumed.

Empirical evidence also suggests that the relationship between consumers and goods influences the speed of hedonic decline. In this sense, consumers satiate more slowly to products that are consistent with their active identity (CHUGANI; IRWIN; REDDEN, 2015). According to this idea, a wine connoisseur will satiate slowly on an expensive bottle than someone less interested in wine. Although all consumers experience hedonic decline, the enjoyment decrease produces dissonance in consumers with an activated identity.

Equally, people get satiated faster to a type of food after repeatedly rating or choosing

among similar foods showed in pictures. Repeated evaluations of food engender spontaneous simulations of the taste of that food item, contributing to the satiation process (LARSON; REDDEN; ELDER, 2014). Another research shows that consumers exposed to the mere possibility of a negative experience (e.g., a scratch on a DVD that degrades the video quality) report slower hedonic adaptation rates than those not exposed to that possibility (YANG; GU; GALAK, 2017). The authors argued that this effect occurs because consumers are likely to feel relief from not having to experience a negative outcome.

Likewise, the social environment is relevant to satiation. Consumers experience an accelerated hedonic decline when they co-experience a stimulus with others. This happens because shared attention makes the repetitive nature of the experience more salient by promoting and incorporating thoughts of others who shared the experience (BHARGAVE et al., 2018).

The way products are consumed also determines the rate of hedonic decline. O'Brien and Smith (2019) demonstrated that hedonic decline is disrupted by consuming familiar things in unconventional ways. Their findings show that consumers eating popcorn with chopsticks (i.e., the unconventional method) experience a slower decline than those eating with hands (i.e., the conventional method). That occurs because unconventional methods invite an immersive "first-time" perspective on the consumption object.

In summary, the rate of hedonic decline may be accelerated or slowed by different reasons, such as personal traits, product features, and consumption context. One of the mechanisms that explain this influence is the attention to the consumption target. Wilson and Gilbert (2008) introduced the AREA (Attend – React – Explain – Adapt) model. The AREA model holds that people attend to new events, react emotionally to these events, reach an understanding of the events, and thereby adapt to the events. This proposition suggests that, while paying high attention to a pleasant event extends its enjoyment over time by slowing down hedonic decline, people who pay low attention to a positive event experience a faster hedonic decline.

Recent research provides empirical support for this assertion. Through a 3-month longitudinal study, Sheldon and Lyubomirsky (2012) showed that well-being gains derived from a positive life change erode by two processes. The first is the decline of positive emotions triggered by this change. The second is the increase in aspirations for even more positivity. These processes, however, are forestalled by continued appreciation of the original life change (SHELDON; LYUBOMIRSKY, 2012). In this sense, the more people think about and attend to a positive change, the more they derive positive emotions from that change (i.e., the slower

their hedonic decline for that experience).

Further, Rodas, Ahluwalia, and Olson (2018) demonstrated that the specificity of consumption goals influences the top-of-mind awareness of the consumption target over time and, as a consequence, its hedonic trajectory. Their findings show that general goals expand the breadth of emotions experienced from consumption activities, which in turn impact the top-of-mind awareness of the consumption target over time. This is relevant because higher top-of-mind awareness of the target allows someone to continue to derive happiness from it. In other words, general goals induce consumers to pay attention to the good or experience for a longer period. The consequence of prolonged attention is a slower hedonic decline.

As stated above, the exposure of consumers to upgrades moves their attention from the status quo to the upgrade (SELA; LEBOEUF, 2017). Because the higher the level of attention to an experience, the slower the hedonic decline for that experience (WILSON; GILBERT, 2008), we assert that the shift in the target of attention caused by the exposure to the upgrade influences the hedonic trajectory for the status quo. Specifically, we propose that consumers exposed to upgrades will pay less attention to the status quo and, as a consequence, will experience a faster hedonic decline for the status quo than those not exposed to upgrades. In the following paragraphs, we describe a series of nine studies that tested this proposition and ruled out alternative explanations (see Table 1).

TABLE 1 – OVERVIEW OF STUDIES

	Consumption Experience	Method	Design/Independent Variables	Dependent Variables	Main Findings
Study 1	iPhone	Secondary data: sentiment classification of tweets	Week when the tweet was posted	Valence of the tweet	There are more negative tweets citing iPhone when upgrades are released
Study 2	iPhone	Survey: two waves of data collection with iPhone owners	Before x After the release of iPhone 12	Enjoyment with the status quo	iPhone owners report less enjoyment after the launch of the upgrade
Study 3	Pen	In-class experiment	Upgrade x No Upgrade	Ongoing enjoyment and desire	Participants exposed to upgrades experience a faster hedonic decline for the status quo
Study 4	Picture	Online experiment	Upgrade x No Upgrade	Ongoing enjoyment and desire; remembered enjoyment; willingness to replace	Participants exposed to upgrades experience a faster hedonic decline for the status quo

	Consumption Experience	Method	Design/Independent Variables	Dependent Variables	Main Findings
Study 5	Picture	Online experiment	Upgrade x No Upgrade x Downgrade	Ongoing enjoyment and desire; remembered enjoyment; willingness to replace	Participants exposed to no upgrades and downgrades experience a similar hedonic trajectory
Study 6	Picture	Online experiment	Upgrade (yes x no) x Attention to the status quo (high x low)	Ongoing enjoyment; willingness to replace	Moderation-based evidence for attention to the status quo as the underlying mechanism
Study 7	Picture	Online experiment	Upgrade x No Upgrade	Ongoing enjoyment; willingness to replace; attention to the status quo	Mediation-based evidence for attention to the status quo as the underlying mechanism
Study 8	Game	Online experiment	Upgrade x No Upgrade	Ongoing enjoyment; willingness to replace; attention to the number of repetitions; perceived repetition	Rule out attention to the number of repetitions and perceived repetition as underlying mechanisms
Study 9	Music	Online experiment	Upgrade x No Upgrade	Ongoing enjoyment; willingness to replace; raising aspirations	Rule out raising aspirations as the underlying mechanism

STUDY 1

We began our investigation of the influence of the exposure to upgrades on hedonic decline with field data on consumers' tweets about iPhones. Because hedonic decline may reflect the gradual decrease in positive feelings triggered by a pleasurable event (FREDERIK; LOWENSTEIN, 1999), we considered tweeting messages expressing negative sentiments as a proxy for hedonic decline. We proposed that iPhone owners would post more negative tweets when a new model was about to be released or was already available for purchase. To test this proposition, we classified tweets about iPhones as either positive or negative through a deep learning Convolutional Neural Networks (CNN) classifier.

Data Collection. We downloaded 72,323 tweets from the Twitter Academic API from January 25, 2016, to January 30, 2020, using the following parameters. Keywords: #iPhone or iPhone; language: English; place: US. We chose iPhones because of the regularity of their upgrade launches and the large buzz in media at each new release. We limited our search to one specific country to control for socioeconomic differences and release dates for new models.

We cleaned the dataset by controlling for the presence of bot-generated messages and removing tweets not posted from iOS devices. To avoid confounds related to comments about new models, we removed tweets citing the models released in the year of the post. For example, in 2016 we deleted tweets citing models SE and 7, while in 2017 we deleted tweets citing models 8 and X. Of the removed tweets, about 91% were bot-generated, 7% were not posted from iOS devices, and 2% cited models released in the year of the post. After these procedures, the final dataset had 30,791 tweets. Then, we randomly selected about 10% of the tweets to hand-code as either positive or negative. This procedure resulted in 3,000 labeled tweets to train and test our sentiment classification algorithm.

Data Vectorization. The deep learning approach requires text vectorization (i.e., tokenize the textual data). Thus, we vectorized the data through word embedding. This process considers the semantic relationship between the words, reflected in the distance and direction of the vectors. We loaded in the model pre-trained word embeddings from Global Vectors Database for Word Representation (GloVe; PENNINGTON; SOCHER; MANNING, 2014).

Cross-validation. We split the dataset into training and validation sets by applying k-fold cross-validation (GERON, 2019). We divided the data into $k = 10$ roughly equal parts. For each kth part, we fit the model to the other $k - 1$ parts of the data set and calculated the prediction error of the fitted model when predicting the kth part of the data. At the end of the k-fold cross-validation process, each model was estimated in 10 randomly selected training datasets, and

tested in different 10 randomly selected test sets. Following this procedure, for each of the folds, we assigned 70% of the dataset to the train and 30% to the test set.

Architecture and Model Performance. We employed the following CNN model to classify the tweets as either positive or negative. Keras sequential model; one embedding layer (input_dim = 10000 [number of top words defined in the tokenizer], output_dim = 100); one one-dimension convolutional layer (filters = 64, kernel_size = 5, activation = 'relu'); one one-dimension pooling layer (global maximum value, data_format = 'channels_last'), and one densely connected binary output layer (units = 1, activation = 'sigmoid'). To load the pre-trained word embeddings into the Embedding Layer, we passed the embedding matrix as the weight of this layer. For compilation, we used Adam optimizer (learning_rate = 0.0001), Binary Crossentropy loss function, and Accuracy metric. We fit the model with 40 epochs, batch size of 50, and validation size of 20%. This model had accuracy = 0.720, F1 score = 0.799, precision = 0.875, recall = 0.736, and area under the curve = 0.703. In **Appendix A**, we show the architecture and performance measures of two competitive models: a bag-of-words and a Recurrent Neural Networks (RNN). Both models showed performance inferior to that of the CNN model.

RESULTS

After establishing the parameters of the CNN classifier with the training and test datasets, we employed this model to predict the valence of the unlabeled 27,791 tweets (i.e., those that were not hand-coded). From this procedure, we got a set of 30,791 labeled tweets (3,000 with hand-coded labels and 27,791 with predicted labels). Figure 1 shows the proportion of negative tweets in each week of the time series. To verify whether consumers posted more negative tweets when upgrades were launched, we ran an OLS linear regression, where the dependent variable was the proportion of negative tweets and the predictor was the week in which the tweet was posted. We coded the predictor as a contrast variable as follows: if the observation was taken in the four weeks before or after the introduction of the new iPhone, then it was coded to 1, otherwise, it was coded to -1. This time window, employed by Shani et al. (2020), allowed us to identify the effect of the buzz about the new models both before and after their release.

Results showed that the week in which the tweet was posted explains the proportion of negative tweets ($F(1, 30{,}789) = 3743$, $p < .001$, $R^2_{adjusted} = 10.84$). The positive coefficient for week ($B = .0145$, $SE = .0002$, $t (30{,}789) = 61.18$, $p < .001$) indicates that there was a higher

proportion of negative tweets when new models were introduced.

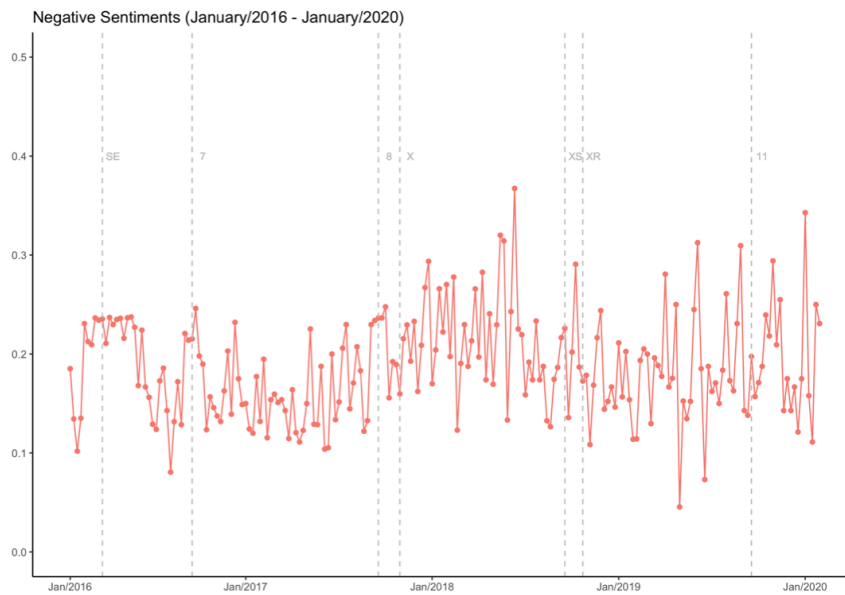Negative Sentiments (January/2016 - January/2020)

FIGURE 1 - PROPORTION OF NEGATIVE TWEETS PER WEEK

DISCUSSION

Using the valence of tweets as a proxy for hedonic decline, Study 1 showed that there is a higher proportion of negative tweets citing "iPhone" in the four weeks immediately before and after the release of a new model. Our results are consistent with those from Shani et al. (2020), who found that consumers are more likely to sell damaged iPhones in the four weeks after the launch of upgrades with improved design. We found, however, that consumers post more negative tweets both in the four weeks before and in the four weeks after the release of a new version. It seems reasonable to infer that consumers post more negative tweets not only after the release, but also in the few weeks before it because they get informed about the model to be launched through media.

Although findings from Study 1 are correlational, they evidence a pattern of results consistent with the notion that the exposure to upgrades induces an accelerated hedonic decline with products consumers already own. The next study investigates the influence of upgrades on the hedonic decline to the status quo by measuring the enjoyment of iPhone owners before and after the launch of a new model.

STUDY 2

The goal of Study 2 was to identify, in a real consumption setting, whether consumers get less enjoyment from their status quo when new versions are introduced. To that end, we measured the level of enjoyment of iPhone owners in two rounds of data collection, before and after the release of iPhone 12 models.

Data Collection. The first round was on September 14, 2020. Five hundred iPhone owners recruited through Prolific Academic answered the survey. We identified iPhone owners through the pre-screening tool of Prolific. From the 500 participants, 498 indicated they had an iPhone. The second round was conducted on October 27, 2020, two weeks after the launch of the iPhone 12. Of the 498 panelists eligible for the second round, 333 answered the survey. In both rounds, participants indicated the model they currently owned and rated their enjoyment with that model (0 - not at all; 100 - very much). Further, we measured control variables, such as how much information participants sought about new models, how much they knew about iPhone 12, likelihood to upgrade, and likelihood to replace for a model other than iPhone 12. For a complete list of the control variables, see Appendix B.

Of the 333 participants who answered the second round, three signaled they had upgraded to iPhone 12 and 43 indicated having a model different from that of the first round. This inconsistency in the owned model suggests that participants either changed their iPhone model in the gap between the two rounds or did not pay enough attention to their answers. Because either changing the model or not paying attention to the survey would harm our results, we removed from the dataset participants who did not have the same model in the first and second rounds. Thus, our final sample was 287 participants (156 females, M_{age} = 31 years). From these, 15% had iPhone 6S or previous models, 15% had iPhone 7 or 7S models, 15% had iPhone 8 models, 28.5% had iPhone X, XS, or XR models, and 26.5% had iPhone 11 or SE (2020) models.

RESULTS

Results from a paired-samples t-test show that participants reported a lower level of enjoyment for their iPhones after the release of iPhone 12 (M_{before} = 83.91, SD_{before} = 18.53, M_{after} = 82.47, SD_{after} = 17.83, t(286) = 2.07, p < .050). Complementarily, we investigated the influence of our control variables on the level of hedonic decline. To that end, we created a hedonic decline index by subtracting enjoyment rates in the first round from enjoyment rates in

the second round. Next, we ran a regression analysis where the dependent variable was the hedonic decline index and the independent variables were the control variables. Results showed no evidence that any of the control variables influenced the index of hedonic decline. For results of the regression analysis and details of the operationalization of the variables, see Appendix B.

DISCUSSION

Study 2 tested our proposition by investigating an actual consumption experience. Results from a survey with iPhone owners suggested that consumers experience a lower level of enjoyment with products they already own after the introduction of a new version. These findings corroborate those from the Study 1 and provide complementary support for the proposition that consumers' exposure to upgrades induces a faster hedonic decline to the status quo.

Given the procedures of Studies 1 and 2, demand effects, self-generated validity, or carryover effects are unlikely to explain the results. Yet their advantages, archival analyses and surveys do not allow researchers to infer causality, identify explanatory processes, and control for alternative explanations. Therefore, all the following studies demonstrate the effect of upgrades on hedonic decline through an experimental approach, manipulating the presence of upgrades, and further delve into the underlying mechanism of reduced attention to the status quo.

STUDY 3

Study 3 investigated whether the exposure of consumers to upgrades causes an acceleration in the hedonic decline with the status quo. To that end, we ran a three-week in-class experiment where one hundred undergraduate students were assigned to two between-subjects conditions: upgrade or no upgrade.

In the first week, we endowed participants with a blue plastic pen (status quo) and requested them to keep it for the next few weeks. They described the pen, and rated how much they liked it (1 - not at all, 9 - very much) and their desire to keep using it (1 - not at all, 9 - very much). In the second week, participants rated their liking and desire for the status quo. Next, they viewed either a blue soft-grip retractable pen (upgrade) or a black pen similar to the status quo (no upgrade). For a picture of the stimuli, see Appendix C. After describing the upgrade or the no upgrade pens and handing them back to the researchers, they rated one more time their liking and desire for the status quo. In the third week, participants simply rated their liking and desire for the status quo. This sequential data collection allowed us to obtain four liking and desire rates, two before and two after the manipulation. Due to attrition, our final sample was 65 participants (29 females, M_{age} = 24 years).

RESULTS

Ongoing Liking. Because the manipulation was after the second liking rate, we employed liking rates for the first trial as a covariate in the analysis. Thus, the dependent variables of the longitudinal analysis described below are the second liking rate (i.e., immediately before the exposure to the upgrade or the no upgrade) and all liking rates after the manipulation. We ran a linear mixed model with the two between-subjects conditions (upgrade x no upgrade), the number of trials, and the initial liking as fixed-factors. The participants' intercept and the slope on the cumulative number of repetitions were random effects. Controlling for the initial liking rate ($p < .001$), results showed a marginally significant interaction between the number of trials and the upgrade exposure ($F(1, 63) = 3.18$, $p = 0.079$). No further effects were significant ($Fs < 2$). For cell means of studies 3 – 8, see Appendix D.

Ongoing Desire. Following the same procedures described for liking rates, we considered the first desire rates as a covariate. We assessed the impact of upgrade exposure on the ongoing desire for the status quo through a linear mixed model. The two between-subjects conditions (upgrade x no upgrade), the number of trials, and the initial desire were fixed-factors.

The participants' intercept and the slope on the cumulative number of repetitions were random effects. Results showed no significant interactions and main effects (Fs < 3).

DISCUSSION

Results of Study 3 provided complementary support for our proposition that the exposure of consumers to upgrades accelerates their hedonic decline for the status quo. Specifically, participants who viewed a better pen (i.e., the upgrade) experienced a faster hedonic decline with their status quo compared to those who viewed a similar pen (i.e., the no upgrade). Because participants were endowed with the status quo and the study had a three-week longitudinal design, Study 3 has a higher level of ecological validity. However, its results may be biased by unidentified confounds. As an example, we did not control whether participants kept or put away the pens they were endowed in the first week. In the next study, we sought to replicate findings from Study 3 in a more controlled way and in a different consumption setting.

STUDY 4

Besides replicating findings from the previous study, Study 4 investigated the influence of the exposure to upgrades on the remembered enjoyment for the status quo and on the decision to replace. We randomly assigned 102 Prolific panelists (53 females, M_{age} = 33 years) to one of two conditions: upgrade or no upgrade.

Participants rated their enjoyment (1 - not at all, 9 - very much) with a black and white picture (status quo) three times. The picture portrayed a seaside village (Appendix E). After the third trial, they viewed either a colored (upgrade) or a sepia version (no upgrade) of the same picture. A pretest (N = 30) indicated that, while the colored picture (M = 7.76, SD = 1.04) was more liked than the black and white one (M = 5.90, SD = 2.01, t(29) = 4.73, p < .001), the sepia picture (M = 5.73, SD = 2.03) was as liked as the black and white one (M = 5.90, SD = 2.01, t(29) = 0.76, p = 0.455). After that, we measured remembered enjoyment by asking participants how enjoyable was the experience of viewing the black and white picture (1- not at all, 9 - very much). Next, they rated their enjoyment for the black and white picture three more times.

After the last trial, participants answered two questions assessing their willingness to replace. First, they rated how happy they would be in repetitively appreciating the colored (or sepia) picture instead of the black and white one (9-point scale). Next, they chose between two hypothetical options: to be paid 5 cents less than they would be paid for the current survey and repetitively view the colored (or sepia) picture, or to be paid the same amount they would be paid for the current survey and repetitively view the black and white picture. Finally, participants answered a manipulation check with three agreement items (1 - strongly disagree, 9 - strongly agree) comparing the colored (or sepia) and the status quo options: black and white picture is… very similar to the colored (or sepia) picture, more beautiful than the colored (or sepia) picture, more enjoyable than the colored (or sepia) picture.

RESULTS

Manipulation Check. Compared to those in the no upgrade condition, participants in the upgrade condition perceived the status quo as less similar to the upgrade (M_{up} = 7.37 vs. $M_{no\ up}$ = 7.92, t(100) = 1.96, p = .052), less beautiful (M_{up} = 4.12 vs. $M_{no\ up}$ = 5.65, t(100) = 3.18, p < .005), and less enjoyable (M_{up} = 3.84 vs. $M_{no\ up}$ = 5.53, t(100) = 3.53, p < .001) than the upgrade.

Ongoing Enjoyment. Because the manipulation was after the third enjoyment rate, we collapsed enjoyment rates for the first and second trials to create an initial enjoyment composite.

Thus, the dependent variables of the longitudinal analysis described below are the third liking rate (i.e., immediately before the exposure to the upgrade or the no upgrade) and all liking rates after the manipulation. We ran a linear mixed model with the two between-subjects conditions (upgrade x no upgrade), the number of trials, and the initial enjoyment as fixed-factors. The participants' intercept and the slope on the cumulative number of repetitions were random effects. Controlling for the initial enjoyment composite ($p < .001$), we found an interaction between upgrade exposure and number of trials ($F(1, 100) = 6.73$, $p < .050$), a main effect for the number of trials ($F(1, 100) = 34.86$, $p < .001$), and no further effects ($F < 1$) (Figure 2).
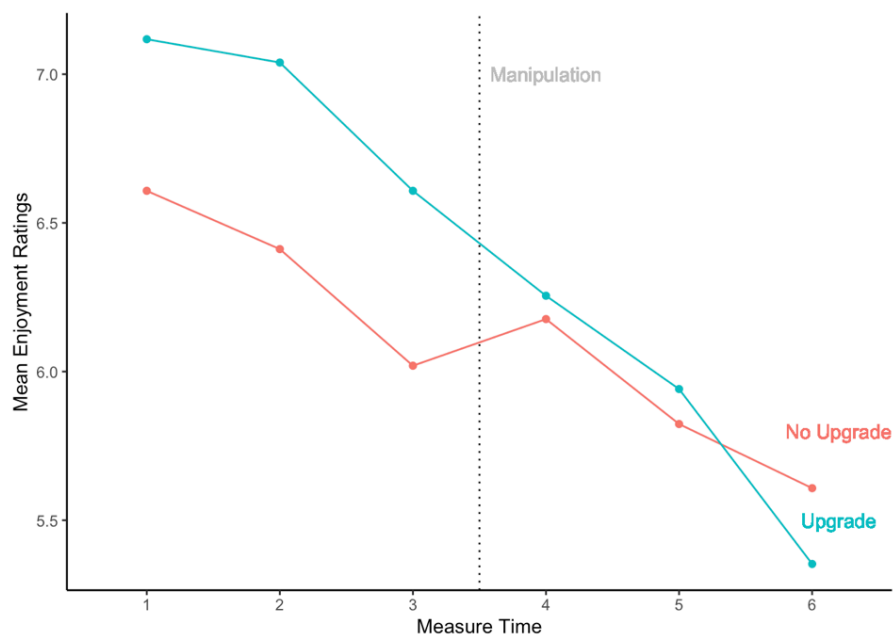

FIGURE 2 – MEAN ENJOYMENT RATINGS (STUDY 4)

Ongoing Desire. Following the same procedures described for liking rates, we collapsed desire rates for the first and second trials to create the initial desire composite. Controlling for the initial desire composite ($p < .001$), we found an interaction between upgrade exposure and number of trials ($F(1, 100) = 15.60$, $p < .001$), a main effect for the number of trials ($F(1, 100) = 54.87$, $p < .001$), and no further effects ($F < 1$).

Happiness for viewing the new version. Participants would be happier in repetitively viewing the upgrade instead of the status quo ($M = 6.71$, $SD = 2.17$) than of viewing the no upgrade instead of the status quo ($M = 4.90$, $SD = 2.24$, $t(100) = -4.14$, $p < .001$).

Replacement Decision. Those in the upgrade condition (25.5%) were more likely to replace than those in the no upgrade condition (5.9%, $X^2(1) = 6.00$, $p < .050$).

Remembered Enjoyment. There was no difference in the remembered enjoyment between the upgrade (M = 6.61, SD = 2.20) and the no upgrade groups (M = 6.24, SD = 2.12, $0 < t < 1$).

DISCUSSION

Study 4 replicates findings from Study 3 by showing that the exposure of consumers to upgrades accelerates their hedonic decline for the status quo. Specifically, participants who repetitively rated a black and white picture (i.e., the status quo) experienced a faster hedonic decline after viewing a colored version of the picture (i.e., the upgrade). Participants who repetitively rated the black and white picture and viewed a sepia version of the picture (i.e., the no upgrade), in turn, experienced a flatter hedonic trajectory.

Importantly, in a hypothetical scenario where participants would receive a lower payment if they chose the new version instead of the status quo, respondents in the upgrade condition were more willing to replace than those in the no upgrade condition. Finally, there was no difference in the remembered enjoyment between the upgrade and the no upgrade groups. Such a result suggests that consumers' perception about their past experience with the status quo does not change as a function of the exposure to the upgrade.

Yet Study 4 provides complementary evidence for the negative influence of the exposure to upgrades on the enjoyment consumers get from their status quo, it is not without limitations. An open question left by this study is how would be the hedonic trajectory for the status quo if the version introduced to participants were perceived as inferior. Further, we measured willingness to replace trough a hypothetical decision, while a decision with a real outcome would provide us a more accurate result. We sought to overcome these limitations in the next study.

STUDY 5

Study 5 builds upon Study 4 in two ways. First, we added a downgrade condition. This design allowed us to test whether the presence of a worse version of the status quo (i.e., the downgrade) would trigger effects opposite to those induced by the upgrades. Second, Study 5 investigated the influence of upgrade exposure on replacement decisions by asking participants to make a choice that would have actual financial consequences to them.

We assigned one hundred twenty-three Prolific Academic panelists (88 females, M_{age} = 34 years) to one of three between-subjects conditions: upgrade, no upgrade, or downgrade. Participants rated their enjoyment (1 - not at all, 9 - very much) with the same black and white picture of Study 4 (status quo) three times. After the third trial, they viewed either a colored (upgrade), a sepia version (no upgrade), or a pixelated version (downgrade) of the same picture (Appendix E). A pretest (N = 30) indicated that the pixelated picture (M = 2.4, SD = 1.69) was less liked than the black and white one (M = 6.83, SD = 1.82, t(29) = 10.77, p < .001).

After rating the status quo six times, we asked subjects to rate a picture three more times and told them they would receive additional payment for these supplementary ratings. Subjects in the *upgrade* condition were presented with the colored and the black and white pictures and asked to choose between the options: "To be paid a 5 cents bonus in addition to my current payment and repetitively view Picture 2[colored] instead of Picture 1 [black and white]" and "To be paid a 10 cents bonus in addition to my current payment and repetitively view Picture 1[black and white] instead of Picture 2 [colored]." In the *no upgrade* and *downgrade* conditions, participants followed the same procedures, but their alternative to the status quo were either the sepia or the pixelated picture. After choosing, participants viewed and rated the chosen option three more three times and received the bonus according to their choice. As an attention check, respondents described the two pictures presented to them.

RESULTS

Ongoing Enjoyment. As in previous studies, we collapsed enjoyment rates for the first and second trials to create the initial enjoyment composite. We ran a linear mixed model with the two between-subjects conditions (upgrade x no upgrade), the number of trials, and the initial enjoyment as fixed-factors. The participants' intercept and the slope on the cumulative number of repetitions were random effects. Controlling for initial enjoyment (p < .001), we found a marginally significant interaction between the number of trials and upgrade exposure (F(1, 120)

= 2.62, p = .076) (Figure 2), a main effect for the number of trials (F(1, 120) = 30.98, p < .001), and no further effects (F < 1).
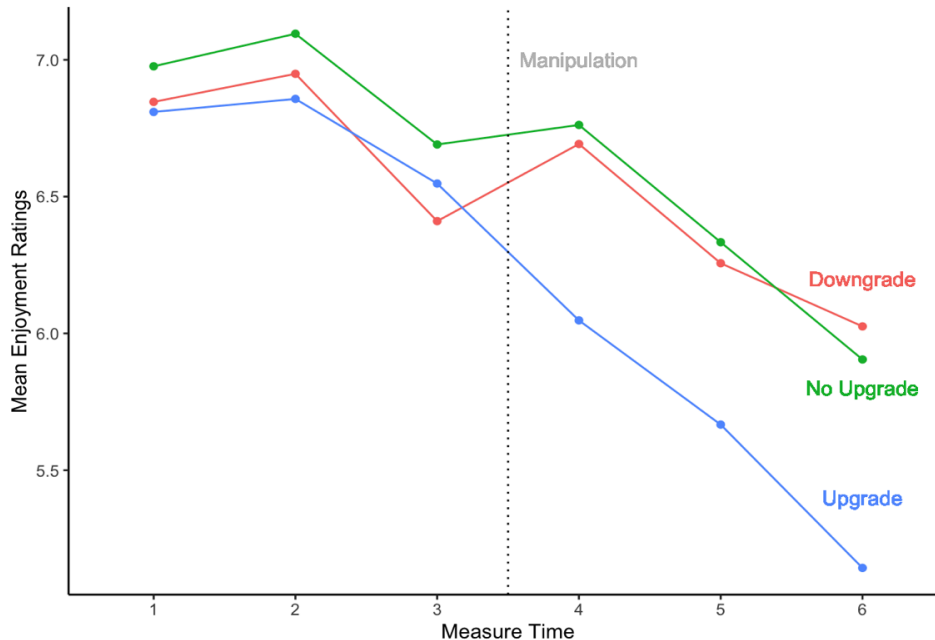

FIGURE 3 - ENJOYMENT RATES (STUDY 5)

Ongoing Desire. We collapsed desire rates for the first and second trials to create the initial desire composite. Controlling for initial desire (p < .001), results of a linear mixed-model showed a main effect for the number of trials (F(1, 120) = 47.50, p < .001) and no further effects (Fs < 1).

Replacement Decision. Those in the upgrade condition (21.4%) were more likely to replace than those in the no upgrade (4.8%) and in the downgrade conditions (0%, $X^2(2)$ = 12.77, p < .002).

Remembered Enjoyment. There was no difference in the remembered enjoyment between the upgrade (M = 6.36, SD = 1.96), the no upgrade (M = 7.07, SD = 1.87), and the downgrade (M = 7.03, SD = 1.58, F < 2) conditions.

DISCUSSION

Results of Study 5 replicate those of previous studies by showing that participants in the upgrade condition experience a faster hedonic decline than those in the no upgrade or in the downgrade conditions. There was no difference in the hedonic trajectory between the no upgrade and the downgrade conditions. These results suggest that a superior version of the status quo is prone to accelerate the hedonic decline. In contrast, an inferior version of the status

quo is not likely to induce a reverse effect on the hedonic trajectory. A plausible reverse effect could be framed as hedonic escalation, whereby consumers experience an increased liking of each additional trial of the product (CROLIC; JANISZEWSKI, 2016).

Importantly, in a decision context with actual financial consequences, we found that participants in the upgrade condition were more likely to replace than those in the no upgrade or in the downgrade conditions. The next studies will delve into the underlying mechanism that explains the influence of exposure of consumers to upgrades on their hedonic decline for the status quo.

STUDY 6

Study 6 investigated our attentional mechanism through moderation. Our proposition states that consumers experience a faster hedonic decline for the status quo after the introduction of the upgrade because their locus of attention moves from the status quo to the upgrade. In the current study, we included a condition where we manipulated the amount of attention participants paid to the status quo. We ran a 2 (Upgrade x No Upgrade) x 2 (High x Low Attention) between-subjects experiment. If the acceleration in hedonic decline were due to a decrease in the attention paid to the status quo after the exposure to the upgrade, drawing attention to the status quo would hinder this effect. Consequently, participants in the high attention condition would not experience a faster hedonic decline when exposed to the upgrade. Put simply, we expected that participants in the high attention condition would report similar hedonic trajectories were they exposed to the upgrade or to the no upgrade. In the low attention condition, however, we expected to find a pattern of results similar to that of previous studies.

One hundred ninety-eight (125 females, M_{age} = 35 years) Prolific panelists rated (101-point slider scale) six times the same status quo picture of studies 4 and 5. Between the second and the third trials, they viewed either the *upgrade* or the *no upgrade* picture. Those in the *high attention* condition answered a variety of attention checks about the status quo (e.g., select from a dropdown list objects that were in the picture, answer how many boats were in the picture, answer if there was a flag in the picture) from the fourth through the last trial. In the *low attention* condition, participants simply rated their enjoyment for the status quo. Next, respondents answered the same replacement decision measure of Study 4.

RESULTS

Ongoing Enjoyment. Because the exposure to the upgrade or the no upgrade was between the second and the third trials, we employed the first enjoyment rate as a covariate in the analyses described below. We conducted separated linear mixed models for *high attention* and *low attention* groups with the two between-subjects conditions (upgrade x no upgrade), the number of trials, and the initial enjoyment as fixed-factors. The participants' intercept and the slope on the cumulative number of repetitions were random effects. In the *low attention* group, controlling for initial enjoyment (p < .001), there was a marginally significant interaction between the number of trials and the upgrade exposure (F(1, 95) = 3.18, p = .077) and a main effect for the number of trials (F(1, 95) = 9.17, p < .01). However, in the *high attention* group,

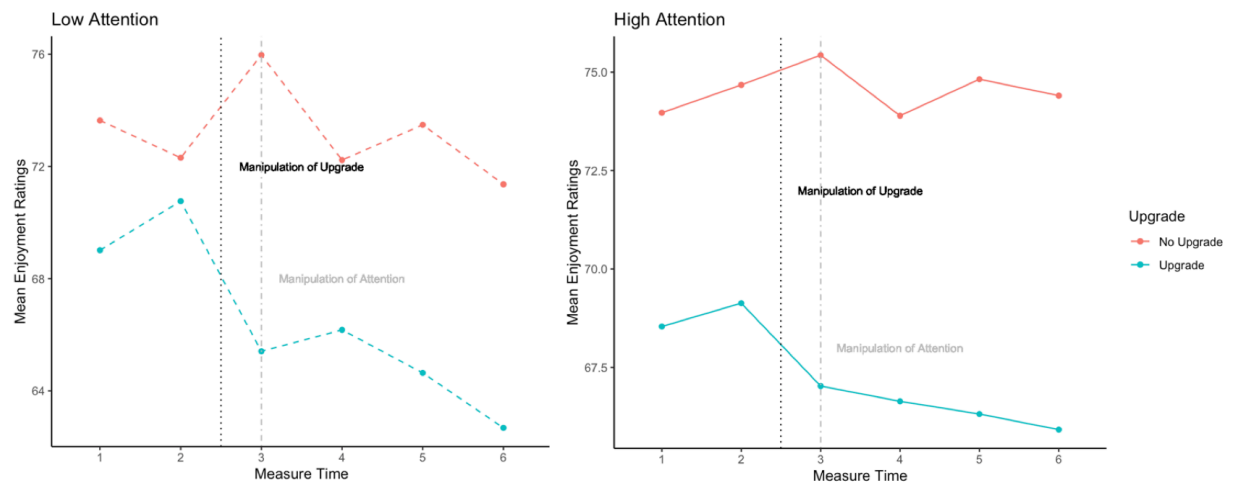there were no significant effects (Fs < 2.5) (Figure 4).

FIGURE 4 - MEAN ENJOYMENT RATINGS (STUDY 6)

Replacement Decision. More participants replaced in the *upgrade* than in the *no upgrade* condition, both in the *low attention* ($X^2(1) = 10.61$, p < .005) and in the *high attention* ($X^2(1) = 11.60$, p < .001) groups.

DISCUSSION

Study 6 provided moderation-based evidence that the acceleration in the hedonic decline caused by the exposure to upgrades is explained by a reduction in the amount of attention paid to the status quo. Specifically, when participants were induced to pay more attention to the status quo, there was no difference in the hedonic trajectory for those who viewed the upgrade and those who viewed the no upgrade. In the low attention condition, however, participants who viewed the upgrade experienced a faster hedonic decline than those who viewed the no upgrade. In other words, our results suggest that drawing the attention of participants to the status quo hindered the influence of the exposure to upgrades on hedonic decline.

Yet its results supported our attentional mechanism, Study 6 was not without limitations. Study 6 manipulated attention by asking participants to attend to specifics of the picture. Such a procedure might induce a new and different perspective of viewing the picture. This different perspective could induce participants to experience a flatter hedonic trajectory (O'BRIEN; SMITH, 2019). In the next study, we sought to overcome these limitations by measuring the level of attention of participants devoted to the status quo while rating their enjoyment.

STUDY 7

Study 7 explored our attentional mechanism through mediation. We proposed that consumers experience a faster hedonic decline for the status quo after the introduction of the upgrade because their locus of attention moves from the status quo to the upgrade. Therefore, we included in Study 7 a measure of the relative attention participants devoted to the upgrade (or no upgrade) versus the status quo. We expected that respondents in the upgrade condition would report a lower level of attention to the status quo than those in the no upgrade condition. Further, we expected that the level of attention would mediate the relationship between exposure to the upgrade and hedonic decline.

Ninety-nine (77 females, $M_{\#}$ = 31 years) Prolific panelists rated eight times the status quo picture. Between the second and the third trials, they viewed either the *upgrade* or the *no upgrade*. After all trials, they indicated the extent to which they based their enjoyment ratings on a slider scale with endpoints: "Entirely on thoughts about the black and white picture" (-3) and "Entirely on thoughts about the colored [or sepia] picture" (+ 3). This measure was adapted from Morewedge, Zhu, and Buechel (2019). In the end, they answered their willingness to replace. Because of a failure in the attention check or an extremely low response time, we removed two participants from the dataset. Thus, our final sample was ninety-seven participants.

RESULTS

Ongoing Enjoyment. Because the exposure to the upgrade or the no upgrade was between the second and the third trials, we employed the first enjoyment rate as a covariate in the analyses described below. Controlling for initial enjoyment (p < .001), results showed a significant interaction between the number of trials and the exposure to the upgrade (F(1, 95) = 5.52, p < .050, and main effects for the number of trials (F(1, 95) = 10.10, p < .005) and for the exposure to the upgrade (F(1, 95) = 5.99, p < .050).

Replacement Decision. More participants chose to replace in the upgrade (40.8%) than in the no upgrade condition (14.6%, $X^2(1)$ = 7.05, p < .010).

Attention to the Status Quo. Results showed that participants in the *no upgrade* condition (M = -1.63, SD = 1.57) devoted a marginally significant higher attention to the status quo than did participants in the *upgrade* condition (M = -0.97, SD = 1.91, t(95) = -1.86, p = .065).

Mediation. To investigate the role of attention to the status quo as the underlying

mechanism of the relationship between the exposure to upgrades and hedonic decline, we ran a mediation analysis. The outcome variable was the rate of hedonic decline, computed by subtracting the enjoyment rate in the last trial from the enjoyment rate in the second trial (i.e., immediately before the exposure to the upgrade or the no upgrade). Previous research (e.g., Rodas et al. 2018) employed similar procedures. The predictor variable was the exposure to the upgrade (upgrade x no upgrade). The mediator variable was the level of attention paid to the status quo. The direct effect of exposure to the upgrade on hedonic decline was significant (B = -4.54, SE = 1.68, 95%CI [-7.8, -1.2]). Importantly, the indirect effect of the exposure to the upgrade on hedonic decline through attention to the status quo was also significant (B = -.71, SE = .70, 95%CI [-2.9, -.004]). These findings provide evidence that the relationship between consumers' exposure to upgrades and their hedonic trajectory for the status quo is mediated by the level of attention to the status quo.

DISCUSSION

Study 7 replicates findings from Studies 3 through 6 and adds further evidence to our proposition. Specifically, participants exposed to upgrades experienced a faster hedonic decline to the status quo than those exposed to the no upgrade. Importantly, Study 7 complements findings from Study 6 by showing that the level of attention to the status quo mediates the influence of exposure to upgrades on hedonic decline. Taken together, Studies 6 and 7 provide moderation-based and mediation-based evidence for our attentional account.

The acceleration of hedonic decline after the exposure of consumers to upgrades, however, might be explained by different underlying mechanisms such as the level of attention to the number of repetitions (REDDEN; HAWS; CHEN, 2017), the perception of more repetitions than the participants actually experienced (NELSON; REDDEN, 2017), and raising aspirations in relation to the status quo (SHELDON; LYUBOMIRSKY, 2012). The following studies sought to rule out these alternative accounts for our findings.

STUDY 8

The objective of Study 8 was to rule out perceived repetition and attention to the number of repetitions as the underlying mechanisms for the influence of exposure to the upgrade on hedonic decline. These are two of the most explored mechanisms for the acceleration of hedonic decline in the literature. Previous studies demonstrated that consumers who experience faster hedonic trajectories are more prone to either overestimate how much they consumed the product (NELSON; REDDEN, 2017) or pay more attention to the number of repetitions to which they were submitted (REDDEN et al., 2017). Further, we sought to generalize the effects of exposure to upgrades on the hedonic decline for the status quo in a different consumption setting.

We randomly assigned one hundred Prolific Academic panelists (65 females, M_{age} = 31 years) to the upgrade or no upgrade conditions. Participants played a game (status quo), rated their enjoyment (0 - not at all, 100 - very much) two times, and viewed the advertisement of either an *upgrade* or a *no upgrade* game. Status quo was a catch game with simple graphics where participants should click with their mouse on circles and avoid clicking on squares. Each circle clicked was worth 50 points and participants would lose 30 points for each time they clicked on a square. After clicking on the figures, we showed the number of points earned/lost on the screen and showed the final score in the end. To promote engagement, we told participants that their goal was to earn 150 points. The number of points earned, however, did not influence participants' ability to proceed to the next trial. The *upgrade* version was a game with the same goals and mechanics of the status quo, but with improved features, such as a colored background, different themes according to the level, the possibility of unlocking power-ups with wins, and rewards for mission accomplishments. The *no upgrade* version was identical to the status quo, except for the color. While the status quo was black and white, the no upgrade version was blue and white (Appendix F).

Participants then indicated their willingness to replace. We asked them "If you would answer a similar survey in the future, which of the following options would you prefer?" The options were "To be paid 10 cents less than I will be paid for the present survey and repetitively play the GAME 2 [game showed in the advertisement] instead of the game that I have played today." and "To be paid the same amount I will be paid for the present survey and repetitively play the same game that I have played today." Next, they played the game nine more times. Finally, they answered how many times they have played the game (perceived repetition measure), and reported their attention to the number of repetitions through an agreement item: I have paid careful attention to how many times I played the game (1 - strongly disagree, 9 -

strongly agree).

RESULTS

Ongoing Enjoyment. Because the upgrade manipulation was between the second and the third trials, the first enjoyment rate was employed as a covariate, and the longitudinal analysis included rates from the second to the eleventh trial as dependent variables. Controlling for initial enjoyment ($p < .001$), we found a marginally significant interaction between the number of trials and the upgrade exposure ($F(1, 98) = 3.11, p = .083$) and no further effects ($Fs < 2$).

Willingness to Replace. Those in the upgrade condition (32.6 %) were more likely to replace than those in the no upgrade condition ($1.8\%, X^2(1) = 15.27, p < .001$).

Perceived Repetition. There was no difference between the perceived repetition for the upgrade ($M = 8.33, SD = 4.22$) and no upgrade groups ($M = 9, SD = 5.49, t < 1$).

Attention to the number of repetitions. There was no difference between the level of attention to the number of repetitions reported by participants in the upgrade ($M = 2.35, SD = 1.45$) and in the no upgrade conditions ($M = 2.3, SD = 1.51, t < 1$).

DISCUSSION

Replicating findings from previous studies, participants in the upgrade condition experienced a faster hedonic decline in comparison to those in the no upgrade condition. Further, Study 8 builds upon previous studies by showing that willingness to replace does not depend on the acceleration of hedonic decline induced by the exposure to the upgrade. Instead, it is caused by the exposure to the upgrade. Yet we measured willingness to replace immediately after the manipulation of upgrade (i.e., before the third trial), participants in the upgrade condition were more likely to replace than those in the no upgrade condition. Although past research has emphasized the relationship between hedonic decline and purchase of new products, highlighting the relationship between this phenomenon and the hedonic treadmill (e.g., Redden 2008), our results did not show any evidence that hedonic decline makes participants more likely to replace.

Finally, there was no difference between groups for perceived repetition and attention to the number of repetitions. These findings provide evidence against these effects as underlying mechanisms for the influence of the exposure to upgrades on hedonic decline. These

accounts are pervasive in past literature exploring the explicative processes of the acceleration in hedonic decline (e.g., NELSON; REDDEN, 2017). Study 9 sought to rule out raising aspirations as an alternative to our attentional account.

STUDY 9

The goal of the last study was to rule out raising aspirations about the status quo as an alternative explanation for the influence of the exposure to upgrades on hedonic decline. To aspire for more of something is to feel that its current quantity or quality is not enough, and to feel that one deserves to get more from it. Sheldon and Lyubomirsky (2012) show that the more people think about and attend to a positive change, the more they derive positive emotions from that change. At the same time, the more people think about and attend to the original change, the more they aspire to even more positive change – a process that ultimately reduces one's well-being. In sum, there are two counteracting effects that compose a seeming paradox of happiness - the same process (continued attention to good things in life) can support and undermine happiness at the same time (SHELDON; LYUBOMIRSKY, 2012). In our context, the exposure of participants to upgrades might trigger more aspirations about the status quo. Thus, raising aspirations about the status quo could be a plausible explanation for the accelerated hedonic decline in the upgrade group.

We randomly assigned one hundred Prolific Panelists (63 females, $M_{age} = 33$ years) either to the upgrade or to the no upgrade condition. Participants listened a song (Nocturne, opera 9, number 2 from Chopin) with a low audio resolution (status quo) and rated their enjoyment (0 - not at all, 100 - very much) nine times. Each trial took at least 10 seconds. Between the second and the third trials, those in the *upgrade* condition listened the same song with a superior audio resolution and were informed it was a higher quality version, while those in the *no upgrade* condition listened one more time the status quo. Immediately after manipulation, participants indicated how much better was the current version in comparison to the previous one (1 - not at all, 9 - very much). After the last trial, participants answered in 9-point agreement scales two items about raising aspirations: "The sound quality would have to be a lot better to make me enjoy the song" and "I deserve to listen a song with a better quality." These items were adapted from Sheldon and Lyubomirsky (2012). Finally, they indicated their willingness to replace through the question "If you would answer a similar survey in the future, how much would you prefer to be paid 5 cents less than today and repetitively listen to the song with a higher sound quality?" (1 - not at all, 9 - very much). Because of failures in the attention check, we removed the responses of two participants from the dataset. Thus, our final sample was ninety-eight participants.

RESULTS

Manipulation Check. Participants in the upgrade condition (M = 6.65, SD = 2.24) perceived the new version as better than those in the no upgrade condition (M = 3.09, SD = 2.13, t(96) = 8.06, p < .001).

Ongoing Enjoyment. As in previous studies, the enjoyment rate for the first trial was a covariate, and the longitudinal analysis included rates from the second to the ninth trial as dependent variables. We ran a linear mixed model with the two between-subjects conditions (upgrade x no upgrade), the number of trials, and the initial enjoyment as fixed-factors. The participants' intercept and the slope for cumulative repetitions were random effects. Results showed, controlling for initial enjoyment (p < .001), a significant main effect for condition (F(1, 95) = 4.35, p < .050) and no main effect for number of trials. Importantly, there was a significant interaction between these variables (F(1, 96) = 3.89, p = .051).

Raising Aspirations. We collapsed raising aspirations items into a single index (r = .64). There was no difference in raising aspirations between the upgrade (M = 4.87, SD = 2.3) and the no upgrade groups (M = 4.3, SD = 2.15, t < 2).

Willingness to Replace. There was no difference in willingness to replace between the upgrade (M = 3.79, SD = 2.64) and the no upgrade groups (M = 4.09, SD = 2.74, t < 1).

DISCUSSION

Study 9 provided evidence for our main proposition in a different consumption domain. One more time, we showed that consumers exposed to upgrades experience a faster hedonic decline than those exposed to a product version that is not better than their status quo. Importantly, findings from Study 9 provided evidence against raising aspirations (SHELDON; LYUBOMIRSKY, 2012) as an alternative mechanism for the influence of the exposure to upgrades on hedonic decline. According to our results, there was no difference in the amount of raising aspirations participants reported in the upgrade and no upgrade conditions.

Different from previous studies, however, participants in the upgrade and in the no upgrade conditions reported similar levels of willingness to replace. These findings provided complementary support to the notion that participants' willingness to replace does not depend on their hedonic decline for the status quo.

GENERAL DISCUSSION AND CONCLUSION

The release of upgrades is part of consumers' routines. People look forward for the newest features added to products, and we often observe long lines at store doors or a shortage of new upgrades sold online. Yet upgrades usually imply technological improvement and, consequently, better products, a question that remains unanswered is whether the launch of new versions is beneficial for consumers' well-being. The current work addresses this issue by showing that the exposure of consumers to upgrades leads them to experience a faster hedonic decline for the product version they already own. That occurs because when consumers are exposed to upgrades, their locus of attention shifts from the status quo to the upgrade.

This statement is grounded on findings from a sequence of studies employing a variety of methodological approaches. Study 1, using the underlying sentiment of tweets as a proxy for hedonic decline, shows that there is a higher proportion of negative tweets citing "iPhone" in the four weeks immediately before and after the launch of new models. Study 2 provides evidence from a real consumption setting that consumers experience a lower level of enjoyment with their status quo after the introduction of a new version. Studies 3, 4, and 5 demonstrate the accelerating effect of exposure to the upgrade on hedonic decline. Importantly, we provide moderation-based (Study 6) and mediation-based (Study 7) evidence that the level of attention to the status quo drives this effect. In Study 6, in the high attention condition, we manipulated how much attention participants were paying to the status quo by inserting questions about it at each trial after the exposure to the upgrade or no upgrade. We found that those in the high attention condition did not experience a faster hedonic decline for the status quo after their exposure to the upgrade. In Study 7, we directly measured how much participants' enjoyment rates for the status quo were guided by thoughts about the status quo or about the upgrade (or no upgrade). Assessments about enjoyment were less guided by thoughts about the status quo in the upgrade than in the no upgrade condition. A mediation analysis demonstrated that the exposure of consumers to upgrades leads them to pay relatively less attention to the status quo and, consequently, experience a faster hedonic decline to it. Finally, we ruled out perceived repetition (Study 8), attention to the number of repetitions (Study 8), and raising aspirations (Study 9) as alternative mechanisms that could explain consumers' reduced enjoyment with their status quo.

INSIGHTS AND IMPLICATIONS

Past research exploring the influence of new-product introduction on consumer response has shown that upgrades induce consumers to seek replacement justifiability, taking less care with the status quo (BELLEZZA et al., 2017) or endangering it (SHANI et al., 2020). Our findings offer a new perspective to this growing body of research. Bellezza et al. (2017) argued they ruled out hedonic decline as an alternative explanation by controlling for a few variables, such as length of ownership, the price paid, and the remaining book value of the status quo. In the same line, Sela and LeBoeuf (2017) discard participants' perceptions of the status quo option and their attitudes toward it as competitive accounts for their findings by measuring happiness and satisfaction with the product. Our results, however, counter these statements by showing that the exposure to upgrades makes consumers experience a faster hedonic decline to the status quo.

Further, our findings extend those from Sela and LeBoeuf (2017) by showing that the shift in the locus of attention from the status quo to the upgrade induced by consumers' exposure to upgrades influences not only replacement decisions but also the rate of hedonic decline to the status quo. In other words, this shift in the locus of attention has consequences not only over consumers' choice, but also over other steps of the consumption process. We found that it accelerates the hedonic decline and hinders the positive emotions consumers derive from consumption.

Our work also contributes to the literature on hedonic decline. We show a novel effect, that the acceleration of hedonic decline results from reduced attention to the status quo product after consumers get aware of an enhanced version of the same product. Our findings are consistent with extant literature investigating the relationship between people's attention to an object and their rate of hedonic decline to it. Sheldon and Lyubomirsky (2012) found that continued attention to a positive event may concomitantly support and undermine happiness. According to the authors, if people want to take advantage of the potential benefits of continued attention, they should keep appreciating the positive event and deriving varied experiences from it. Further, Rodas et al. (2018) showed that hedonic decline slows down when a purchase stays top of mind. Consumers achieve top-of-mind awareness for a product by employing specific instead of general consumption goals.

The current work demonstrates that the exposure of consumers to upgrades may reduce their level of attention to products they already own. This diminished attention, as found in past research, leads to the acceleration of hedonic decline. Past research, however, suggested

strategies that require consumers to exert strong effort, whether for varying the experiences they have with the product or for controlling the specificity of consumption goals. Our work, in turn, provides a simpler way to avoid decreasing attention. It is reasonable to infer from our findings that the less someone knows about an upgrade, the more they will keep enjoying the version they currently own. Spontaneously avoiding the search for information about upgrades is an easy action that does not require any kind of training for consumers and may improve their well-being.

Overall, our findings shed light on the potential harm of upgrade releases on consumers' well-being. At a first glance, the launch of upgrades should be beneficial for consumers for some reasons. First, as a rule, updated versions are technically better. Second, when early models are not discontinued, buyers have a more varied set of options to choose from. Finally, companies usually lower the price of early models, making the product accessible to more customers. Results from our research, however, show that the launch of upgrades may impair consumers' well-being by accelerating their hedonic decline to products they currently own. This effect may create unintended consequences such as overspending, dissatisfaction, and even unnecessary consumption, increasing environmental problems.

From the consumers' point of view, it is relevant to understand how their preferences and hedonic decline are constructed. Apprehending how hedonic decline is accelerated or slowed by factors related to the consumption context and product properties may allow them to strategically manage their consumption desires. Put simply, consumers' knowledge about how upgrades influence their hedonic trajectory for currently owned goods may help them to avoid the psychological traps that conduct to a faster hedonic decline.

ALTERNATIVE ACCOUNTS

We directly addressed three alternative explanations through our studies. First, we did not find any evidence of the influence of raising aspirations in the acceleration of hedonic decline. Although Sheldon and Lyubomirsky (2012) showed that raising aspirations undermine happiness by accelerating hedonic decline, results from Study 9 demonstrate that the exposure of consumers to upgrades does not induce them to aspire for having a better experience with their status quo. These findings, however, are limited by the design of Study 9. While Sheldon and Lyubomirsky (2012) explored raising aspirations resultant from continued attention to good things in life, we measured whether the exposure of consumers to upgrades influence the level

of raising aspirations. Future research should dive into the relationship between the launch of upgrades, attention to the status quo, and raising aspirations.

In addition to raising aspirations (SHELDON; LYUBOMIRSKY, 2012), we ruled out perceived repetition (NELSON; REDDEN, 2017) and attention to the number of repetitions (REDDEN et al., 2017) as alternative mechanisms for the influence of exposure to upgrades on hedonic decline. Another alternative explanation for this influence, however, might be contrast effects. Contrast effects occur when the enjoyment someone derives from an initial sample serves as a frame of reference against which a second experience is judged (NOVEMSKY; RATNER, 2003). If our findings were guided by contrast effects, participants would experience an accelerated hedonic decline after exposure to the upgrade because they simply perceived the status quo as worse than the upgrade.

Nevertheless, the emergence of contrast effects requires sufficient attentional resources to notice differences between a target and a standard (MOREWEDGE et al., 2019). Considering that consumers usually do not spontaneously compare upgrades and status quo because they do not consider the status quo as in need of evaluation (SELA; LEBOEUF, 2017), contrast effects are unlikely to explain our findings. Further, results from Studies 4 and 5 help to address this alternative account. In both studies, there were no differences in the remembered enjoyment between the upgrade and the no upgrade groups. These results suggest that consumers' perceptions about their past experience with the status quo do not change as a function of the exposure to the upgrade.

Finally, one may argue that our findings would be explained by expectancy disconfirmation (OLIVER, 1993). However, this is an unlikely alternative account because of the affective nature of the phenomenon we explored. Expectancy disconfirmation is based on predictions about product attributes and/or performance (PATRICK; MACINNIS; PARK, 2007), while we measured enjoyment with the currently owned product. Complementarily, Studies 5 and 8 provide empirical evidence against this account. If our results were driven by expectancy disconfirmation, participants in the downgrade condition (Study 5) should report increasing levels of enjoyment after their exposure to the downgrade. Study 8, in turn, measures participants' aspirations about the status quo after their exposure to upgrades or no upgrades. If expectancy disconfirmation were a plausible explanation for our findings, participants in the upgrade group should have reported higher aspirations in relation to the status quo than those in the no upgrade group.

FUTURE DIRECTIONS

The idea of the launch of upgrades influencing consumers' enjoyment with products they currently own raises fruitful avenues for research. Yet our work was limited to product upgrades, it is plausible to speculate that similar findings would be found in different contexts. Future work should investigate whether thinking about potentially positive life changes would harm enjoyment with the current state. For example, would envisaging a better employment condition make someone derive less happiness from their current position?

Future research should also explore the extent that information seeking about upgrades influence enjoyment with the status quo. Our work directs attention to the influence of consumers' awareness about the upgrade on their hedonic trajectory for the status quo. These findings could be extended to examine whether consumers who seek more information about the upgrade would be more prone to experience the acceleration of hedonic decline with the status quo.

Also, a direction for future work is to investigate how upgrades of complementary products and accessories would influence consumers' enjoyment with a currently owned product. Frequently, companies launch improved accessories, such as headsets for smartphones, that are only compatible with the newest version of a product. Future work could also investigate whether the release of appealing incompatible accessories would cause the acceleration of hedonic decline with a product.

Finally, a particularly fruitful next direction would be to explore boundary conditions for our findings. While we show that consumers' exposure to upgrades induces hedonic decline with the status quo, it seems plausible to expect that the same results would not replicate if consumers were exposed to a product upgrade they did not appreciate. An example of an innovation that triggered complaints from consumers was when Apple cut the headphone jack in the iPhone 7.

CONCLUSION

The present research adds a novel effect to the hedonic decline and upgrade literatures, and brings researchers closer to the understanding of how the exposure of consumers to upgrades shapes their experience with the status quo. Being exposed to upgrades induces a faster hedonic decline to the status quo because it moves consumers' attention from the status quo to the upgrade. Thus, given how many improved versions of products are launched every

year, it is not surprising that consumers enjoy less their products over time. This work has found a link between exposure to upgrades and hedonic decline that can inform people and help them to extend the hedonic benefits of already owned products by enjoying them for longer.

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APPENDIX A

Sentiment Analysis: bag-of-words. The "bag-of-words" approach considers each word as a single entity and simply classifying it according to its valence. Before conducting the "bag-of-words" sentiment analysis, we extracted the tweets' text and cleaned it by removing URLs, special characters, punctuation, numbers, unnecessary spaces, and stop words (e.g., articles, adverbs, etc). Next, we converted all words to lower case and built the corpus to be used in the sentiment analysis.

We carried out the sentiment analysis through the package syuzet for R (Jockers 2017). Its algorithm conducts a rule-based classification using a variety of sentiment dictionaries. For each text unity, in our context a tweet, the algorithm provides a load for the positive and negative dimensions of the text. Those text unities that show a higher load on the positive dimension are classified as positive. Those that show a higher load on the negative dimension are classified as negative. Finally. Those that show equal loads on positive and negative dimensions are classified as both positive and negative.

From the 3000 tweets, the sentiment analysis algorithm classified 1058 as positive, 563 as negative, and 1379 as both positive and negative. To evaluate the performance measures of the algorithm, we collapsed the negative and the both negative and positive tweets. Thus, we got 1058 positive tweets and 1942 negative tweets.

Performance measures showed that the sentiment analysis had accuracy = 0.529, F1 = 0.532, precision = 0.409, recall = 0.761, and AUC score = 0.581. We speculate that such a poor performance is due to the nature of the algorithm, which employs a "bag-of-words" approach. In other words, such a classifier does not understand subtle textual structures and, consequently, does not categorize the text according to its overall meaning.

Recurrent Neural Networks (RNN). For the RNN model, we implemented LSTM (Long Short-Term Memory) layers, which perform better than basic RNN layers for long text sequences because they add a way to carry information across many timesteps, detecting long-term dependencies in the data (Chollet, 2018; Geron, 2019). We employed the following RNN model to classify the tweets as either positive or negative. Keras sequential model; one embedding layer (input_dim = 10000 [number of top words defined in the tokenizer], output_dim = 100 [number of embedding dimensions defined in the tokenizer]); a first LSTM layer (units = 32, return_sequences = True); a second LSTM layer (units = 32); and a densely connected binary output layer (units = 1, activation = 'sigmoid'). To load the pre-trained word

embeddings into the Embedding Layer, we passed the embedding matrix as the weight of this layer. For the model compilation, we used Adam optimizer (learning_rate=0.01), Binary Crossentropy loss function, and Accuracy metric. We fit the model with 40 epochs, batch size of 32, and validation size of 20%. Results show that the RNN model has accuracy = 0.719, F1 = 0.779, precision = 0.777, recall = 0.781, and AUC = 0.696 for the test set.

APPENDIX B

FIRST ROUND – QUESTIONNAIRE (STUDY 2)

• Which is your iPhone model?

   o iPhone SE (2020)
   o iPhone 11 Pro Max
   o iPhone 11 Pro
   o iPhone 11
   o iPhone XS Max
   o iPhone XS
   o iPhone XR
   o iPhone X
   o iPhone 8 Plus
   o iPhone 8
   o iPhone 7 Plus
   o iPhone 7
   o iPhone SE (2016)
   o iPhone 6S Plus
   o iPhone 6S
   o iPhone 6 Plus
   o iPhone 6
   o iPhone 5S
   o iPhone 5C
   o iPhone 5
   o iPhone 4S
   o iPhone 4
   o iPhone 3GS
   o iPhone 3G
   o iPhone (first generation)
   o Other (please specify)

• How much do you enjoy using your iPhone? (0 - not at all; 100 - very much)

• How much information about the new iPhone models that Apple will launch in 2020 did you search? (0 - not at all; 100 - very much)

   o New Functionalities
   o Configuration
   o Release Date

• How likely are you to upgrade to one of the new iPhone models that Apple will launch in 2020? (0 - not at all; 100 - very much)

• How likely are you to replace your current iPhone with an already available model? (0 - not at all; 100 - very much)

SECOND ROUND – QUESTIONNAIRE (STUDY 2)

• Which is your iPhone model? (Same options as in the first round)

• How much do you enjoy using your iPhone? (0 - not at all; 100 - very much)

• How much do you know about the iPhone 12 models that Apple introduced on October, 13? (0 - not at all; 100 - very much)

• Please select all the options below you believe are TRUE. This question is not an attention check and the correctness of your answers will not affect your payment.
    o iPhone 12 models come with 5G support [TRUE]
    o iPhone 12 models have a fingerprint sensor for quickly unlocking your phone [FALSE]
    o iPhone 12 models have a camera that is better at taking photos in the dark [TRUE]
    o iPhone 12 models have an always-on display so that you can see the time without picking up your phone [FALSE]
    o iPhone 12 models have a refreshed design [TRUE]
    o iPhone 12 models have a higher refresh rate for smoother scrolling [FALSE]

• Have you preordered any of the iPhone 12 models? (Yes x No)

• If you answered YES, please select the model you have preordered. (Dropdown menu)
    o iPhone 12 Mini
    o iPhone 12
    o iPhone 12 Pro
    o iPhone 12 Pro Max

• How likely are you to replace your current iPhone for an iPhone other than iPhone 12 models? (0 - not at all; 100 - very much)

• Are you aware that iPhone 12 models will come without a charger? (Yes x No)

• How much do you like the idea of buying an iPhone without a charger? (0 - not at all; 100 - very much)

OPERATIONALIZATION OF INDEPENDENT VARIABLES (STUDY 2)

Variable	Scale	Operationalization	Measurement Time
Family	Categorical	We grouped the models into families and created a contrast variable	1st and 2nd rounds
Information about the new model - before release	0-100 (3 items)	We collapsed the three items (alpha = .91) and standardized the index	1st round
Upgrade likelihood	0-100	Standardization	1st round
Replacement likelihood	0-100	Standardization	1st and 2nd rounds
Information after release - self-report	0-100	Standardization	2nd round
Quiz about new models	0-6: number of correct questions	Standardization	2nd round
Likelihood to upgrade for each of the new models	0-100	We identified the highest likelihood to upgrade in the four models and standardized this value	2nd round
Pre-ordered new model	Yes x No	Contrast	2nd round
Awareness about the lack of charger	Yes x No	Contrast	2nd round
Liking about lack of charger	0-100	Standardization	2nd round

RESULTS FROM LINEAR REGRESSION (STUDY 2)

	B	SE	t	p
Intercept	-3.5444	1.9140	-1.852	0.065
Family	-0.5716	1.1722	-0.4880	0.626
Information about the new model - before release	-0.7605	0.9273	-0.8200	0.412
Upgrade likelihood - T1	1.3706	1.0125	1.3540	0.177
Replacement likelihood - T1	-0.9835	0.8938	-1.1000	0.272
Replacement likelihood - T2	-0.7577	0.8401	-0.9020	0.367
Information after release - self-report	0.7633	0.9964	0.7660	0.444
Quiz about new models	-1.1341	0.7759	-1.4620	0.145
Likelihood to upgrade for each of the new models	0.3369	0.9752	0.3450	0.730
Pre-ordered new model	-2.4360	1.9044	-1.279	0.201
Awareness about lack of charger	-0.2439	0.7542	-0.3230	0.746
Liking about lack of charger	-0.4607	0.7728	-596	0.551

$F(11, 275) = 0.76$, $p = 0.68$

APPENDIX C

Stimuli – Study 3

APPENDIX D

	Group		DV		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T1!
Study 3	Upgrade		Liking	—	6.51	6.36	6.33	6.23	—	—	—	—	—	—	—
			Desire	—	6.82	6.62	6.46	6.38	—	—	—	—	—	—	—
	No Upgrade		Liking	—	6.38	6.58	6.58	6.81	—	—	—	—	—	—	—
			Desire	—	7.19	7.27	7.15	7.42	—	—	—	—	—	—	—
Study 4	Upgrade		Enjoyment	—	7.12	7.04	6.61	6.25	5.94	5.35	—	—	—	—	—
			Desire	—	6.27	5.88	5.22	4.27	3.63	3.39	—	—	—	—	—
	No Upgrade		Enjoyment	—	6.61	6.41	6.02	6.18	5.82	5.61	—	—	—	—	—
			Desire	—	5.78	5.22	4.63	4.75	4.29	4.16	—	—	—	—	—
Study 5	Upgrade		Enjoyment	—	6.81	6.86	6.55	6.05	5.67	5.14	—	—	—	—	—
			Desire	—	6.1	5.36	4.67	4.02	3.57	3.36	—	—	—	—	—
	No Upgrade		Enjoyment	—	6.98	7.1	6.69	6.76	6.33	5.9	—	—	—	—	—
			Desire	—	6.52	6.07	5.38	4.76	4.64	4.4	—	—	—	—	—
	Downgrade		Enjoyment	—	6.85	6.95	6.41	6.69	6.26	6.03	—	—	—	—	—
			Desire	—	6.36	5.72	4.9	4.74	4.54	4.15	—	—	—	—	—
Study 6	Upgrade	High Attention	Enjoyment	—	68.5	69.1	67.0	66.6	66.3	65.9	—	—	—	—	—
			Willingness to Replace	41%	—	—	—	—	—	—	—	—	—	—	—
		Low Attention	Enjoyment	—	69.0	70.7	65.4	66.1	64.6	62.6	—	—	—	—	—
			Willingness to Replace	44%	—	—	—	—	—	—	—	—	—	—	—
	No Upgrade	High Attention	Enjoyment	—	73.9	74.6	75.4	73.8	74.8	74.4	—	—	—	—	—
			Willingness to Replace	8.8%	—	—	—	—	—	—	—	—	—	—	—
		Low Attention	Enjoyment	—	73.6	72.3	75.9	72.2	73.4	71.3	—	—	—	—	—
			Willingness to Replace	12%	—	—	—	—	—	—	—	—	—	—	—
Study 7	Upgrade		Enjoyment	—	71.1	71.1	66.1	65.5	65.3	63.5	61.9	61.1	—	—	—
	No Upgrade		Enjoyment	—	74.1	73.4	76.2	76.6	75.2	74.5	73.6	73.7	—	—	—
Study 8	Upgrade		Enjoyment	—	43.8	44.8	41.6	41.9	40.2	37.8	36.2	33.0	32.0	31.6	29.(
	No Upgrade		Enjoyment	—	36.5	36.9	37.0	37.0	35.3	32.9	33.7	31.7	29.6	29.7	29.'
Study 9	Upgrade		Enjoyment	—	65.0	62.7	52.1	51.9	48.6	46.4	45.7	43.6	43.8	—	—
	No Upgrade		Enjoyment	—	61.6	60.8	55.9	52.65	53.4	49.6	49.1	49.1	51.6	—	—

APPENDIX E

Status Quo – Studies 4-7

Upgrade – Studies 4-7

Downgrade – Study 5

APPENDIX F

In this game you must catch circles
and avoid squares.

Press Space Bar to Continue.

Status Quo – Study 8

HI! I WAS TRAVELING
ACROSS GALAXIES AND I'VE
FOUND YOUR PLANET!

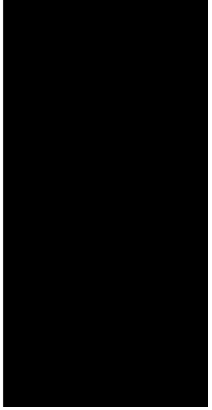DO YOU WANNA JOIN ME
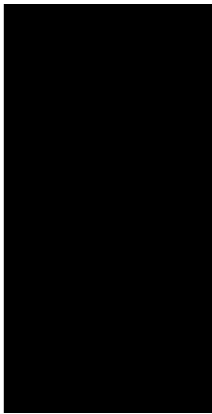ON MY TRIP?

Press Space Bar to Continue
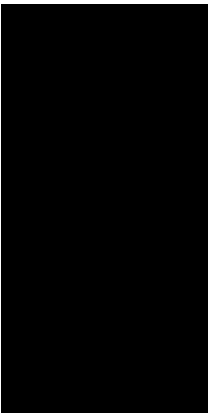
Upgrade – Study 8

In this game you must catch circles
and avoid squares.

Press Space Bar to Continue.

No Upgrade – Study 8