Consumer Reactions to Automated Products: Two Experiments on the Role of Task Hedonism and Consumer Nostalgia

Patrick Kremer
Goethe-Universität Frankfurt
Sven Feurer
Karlsruhe Institute of Technology
Ju-Young Kim
Goethe-Universität Frankfurt

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Abstract:

The introduction of automated consumer products is constantly gaining momentum. In order to investigate the effect of automation on consumers' anticipated happiness we conducted two independent studies to identify the role of task hedonism and consumer nostalgia. The findings of Study 1 suggest that automation enables consumers to perceive a release of free resources which in turn increases happiness. However, this effect only occurs for focal tasks being perceived as rather low on a hedonic dimension. If the perceived ex ante task hedonism is rather high the positive effect of automation on perceived freed-up resources diminishes. In addition, Study 2 shows that automation is able to increase the perceived hedonic value of the focal task which increases consumer happiness. For consumers high in nostalgia the effect of automation on perceived task hedonism diminishes. Concluding, we highlight the importance of individual differences for the acceptance of automated consumer products.

Keywords: Automation, Hedonism, Nostalgia

Track: Innovation Management & New Product Development

1. Introduction

The introduction of automated products, defined as products offering features that execute a task previously carried out by the consumer, is gaining momentum (Leung, Paolacci and Puntoni, 2018). Examples include cooking machines, automated fishing rods or self-driving cars.

However, not all consumers appreciate automated products. For example, Rijsdijk and Hultink (2003) report a higher perceived risk and complexity associated with automation, and stress the moderating role of desire for control for the autonomy-perceived risk relationship (see also Faraji-Rad, Melumad and Johar, 2017). Similarly, Waytz, Heafner and Epley (2014) find trust playing a central role in consumer reactions to self-driving cars. Very recently, Leung et al. (2018) demonstrate that consumers who strongly identify with a particular social category tend to resist automated products when these automated products hinder the attribution of identity-relevant consumption outcomes.

Our study examines consumer reactions to automation from a different angle. Specifically, we argue that while some consumers may value the convenience of not having to carry out tasks themselves, others may perceive automation as a threat to their enjoyment of the task. Consider a self-driving car that implies great utility in terms of safety and the time that becomes available for other activities (e.g., sleeping, reading, or simply enjoying the ride). However, many consumers, especially in countries such as the US where driving seemingly is part of the cultural DNA, wonder whether they still feel the joy, when cars do the driving (Yeager, 2018). Apparently, carrying out even such a mundane and monotonous task like driving for hours may be perceived as being a highly hedonic task (Yeager, 2018).

Thus, an important question arises whether consumers still derive happiness from automated products, an aspect neglected by prior literature. Our research focuses on the nature of the focal task that is automated (vs. not), specifically, the extent to which this task is perceived as hedonic. Two independent studies investigate this issue from different angles. In Study 1, we argue that automation affects consumer happiness through its ability to free-up valuable resources, and expect this indirect effect to depend on ex ante task hedonism (i.e., the extent to which consumers generally categorize a task "fishing", "driving" etc. as hedonic). In contrast, Study 2 treats hedonism as a mediator, examining whether automation impacts consumer happiness by altering consumers' perceived hedonic value of the focal task in a positive or negative way. As such, Study 2 argues that the very experience of carrying out the focal task is being affected by automation depending on individual differences. Specifically,

we expect consumers' trait nostalgia to be a central moderator in this context. Notably, our understanding of automation pertains to the consumption, not to the production of products.

2. The Ability of Automation to Free-up Resources and the Role of Ex Ante Perceptions of Task Hedonism (Fishing Rod Experiment)

2.1 Motivation and hypotheses

Leung et al.'s (2018) work constitutes an important step forward in our understanding of consumer reactions to automation. However, consumers may prefer automated products regardless of their identity-relevant consumption. For example, a passionate racing driver may be very impassionate about driving if the task is seen as purely utilitarian (e.g., commuting to work). In the latter case, automation may free-up valuable resources (Leung et al., 2018), in turn increasing consumer's happiness. The extent, to which this occurs, however, may depend on consumers' ex ante perceptions of the nature of the task as rather hedonic or utilitarian.

Hence, the first objective of study 1 is to examine if automation affects perceived happiness and whether an individual's perception of freed-up resources (i.e., time, effort) mediates the effect of automation on happiness. Due to the fact that automated products carry out tasks that consumers usually carry out themselves, we expect that automation will positively impact an individual's perception of freed-up resources. Free resources in turn can be viewed as an ambiguous currency that can be allocated to different activities similar to the concept of time allocation resulting in an increased degree of happiness (Festjens & Janiszewski, 2015).

H1: The perceived ability to free-up resources mediates the effect of automation on perceived happiness such that the indirect effect is positive.

The second objective of study 1 is to examine the moderating role of perceived ex ante task hedonism for the relationship proposed in H1, accounting for the fact that individual perceptions play a major role for consumer happiness (Mogilner, Aaker and Kamvar, 2012).

Specifically, if the task in general is perceived as highly hedonic, we expect that consumers will not perceive the automation as being able to release resources. As such, the indirect effect proposed above should be stronger for consumers perceiving the task (e.g., "fishing") in general as being low on the hedonism dimension. We thus hypothesize:

H2: Perceived task hedonism weakens the effect of automation on the perceived ability to free-up resources.

2.2 Method

We used a commercial consumer panel to recruit an effective sample of 131 participants (53.4% female, median age 48) to participate in an online experiment using a one-factorial (automated vs. not automated) between-subjects design. Subjects were randomly assigned to the two experimental conditions. Participants received a cover story about a vacation they spent in a cottage by a lake in Sweden. They were asked to imagine that they found fishing gear in the closet and decided to catch something for dinner. In the automated condition, the fishing rod was fully automated (a product that is actually available) and in the not automated condition, the fishing rod was a conventional one.

Subjects then went on to respond to a short questionnaire. Happiness was measured on a four-point scale adopted from van Boven and Gilovich (2003) as well as Hills and Argyle (2002) ($\alpha = .96$), and perceived ex ante task hedonism was measured by averaging two seven-point items regarding to what extent the activity "fishing" was generally perceived as appealing and exciting ($r = .90$). The perceived ability to free-up resources was also measured by averaging two seven-point items capturing to what extent participants thought using the focal fishing rod would enable them to perform other activities while fishing ($r = .87$).

We also included a measure of nostalgia ($\alpha = .82$) and a measure of perceived self-efficacy ($\alpha = .94$) as covariates. Thus, we exclude the possibility that automated products induce feelings of nostalgia (Holbrook, 1993; Loveland, Smeesters and Mandel, 2010) or loss of control (Faraji-Rad et al., 2017; Rijsdijk & Hultink, 2003; van Doorn et al., 2016) that may otherwise represent rival causal explanations for our findings.

2.3 Results and discussion

The manipulation check for automation of the fishing function ("This fishing rod was 1=definitely not automated, 7=definitely fully automated"; $M_{auto} = 5.90$; $M_{notauto} = 3.48$; $F(1,184) = 81.868$; $p < .001$) indicated that the manipulation was successful in the intended direction. To test the hypotheses, we performed a regression-based conditional process analysis using Hayes' PROCESS macro for SPSS (model 7) with automation (dummy-coded with 1=present and 0=absent) as IV, anticipated happiness derived from fishing with the rod in the described scenario as DV, and perceived ability to release free resources as our mediator. Perceived hedonism of the general task "fishing" was included as a moderator influencing the effect of automation on the mediator.

Our results show a positive effect of automation (b = 2.02; t = 3.19; p = .002) for the regression model with perceived ability to release free resources as the outcome (F(5, 125) = 13.067; p < .001; R^2=.343). In line with our expectations, the results also reveal a negative and significant automation × fishing hedonism interaction (b = -.24; t = -1.76; p = .081), suggesting a trend in the data such that for consumers with high (low) levels of perceived task hedonism, the positive effect of automation on the ability to release free resources is reduced (enhanced). A floodlight analysis (Spiller, Fitzsimons, Lynch, McClelland, 2013) was performed to decompose this interaction (Figure 1). The slope for general fishing hedonism is slightly negative in the automated condition, and positive in the not automated condition. As such, the simple main effect of automation is positive for large parts of the range of the fishing hedonism scale. However, a Johnson-Neyman point of 5.99 can be identified, indicating that for larger ex ante hedonism values, the positive simple main effect of automation turns insignificant such that consumers do not think that automation will allow them to release resources while fishing.
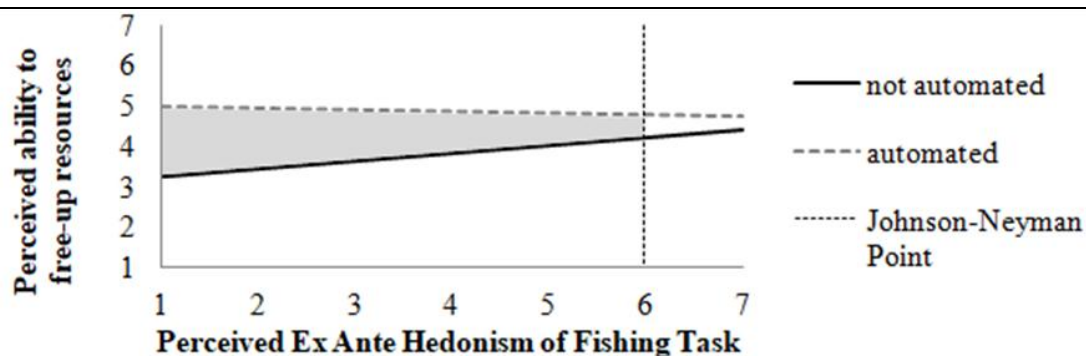

Figure 1. Floodlight Analysis (Fishing Rod Study)

The results for the regression model with happiness as the outcome (F(4, 126) = 32.457; p < .001; R^2=.507) show a negative but insignificant effect of automation (b = -.04; t = -.149; p = .882) and a positive and significant effect of the perceived ability to release free resources (b = .19; t = 2.59; p = .011). In sum, the results suggest a moderated mediation such that for low levels of general fishing hedonism (2.024 or 1SD below the mean of 4.03), the indirect effect of automation on happiness through the perceived ability to release free resources is positive (.29) and significant (95% CI [.038, .597]). At the mean of general fishing hedonism, the indirect effect is .20 and significant [.025, .433] and for high fishing hedonism (6.029 or 1SD above the mean) the indirect effect is .108 but no longer significant with a 95% CI including zero [-.027, .340]. Taken together, the findings support H1 and H2: Automation has the capability to increase happiness through the ability to free-up resources the consumer

perceives as valuable, but this effect does not occur for individuals enjoying the fishing task.

3. The Ability of Automation to Alter the Hedonic Value of the Task, and the Role of Consumers' Nostalgia (Car Experiment)

3.1 Motivation and hypotheses

In Study 1, we examined the moderating effect of ex ante task hedonism (i.e. fishing) on the perceived ability to release resources and thus happiness. Study 2 now examines a different mechanism by which automation may affect consumer happiness through the perceived hedonic value derived from the focal task. For example, will consumers derive more or less hedonic value from the driving activity in an automated (vs. not automated) car?

We propose that the extent to which automation affects the perceived hedonic value of the focal task depends on consumers' nostalgia. Evidently, in times of rapid technological development, we see a rise in consumer demand for nostalgic products, designs, and brands (Loveland et al., 2010). For example, driving is often associated with a feeling of independence and "feeling the wind in your hair" even though this feeling dates back to experiences made a long time ago (Hinsliff, 2016). As such, driving might evoke beloved memories of prior experiences connected to this task that are not present anymore if the driving task gets automated. Building on prior research (Holbrook & Schindler, 2003), we conceptualize nostalgia as a consumer trait resulting in "a preference (general liking, positive attitude, or favorable affect) towards objects (people, places, or things) that were more common (popular, fashionable, or widely circulated) when one was younger (in early adulthood, in adolescence, in childhood, or even before birth)." (p. 330). Nostalgic consumers like to reconnect with their pasts and with social communities by thinking about occasions in which a product was consumed, creating a feeling of belongingness (Loveland et al., 2010).

Nostalgic experiences include the self as the focal protagonist in meaningful instances of life underlining the importance of the construct to the self and the perception of experiences (Zhou, Wildschut, Sedikides, Shi, Feng, 2012). Transferring this notion to the realm of automation, nostalgia could become a relevant factor in explaining consumer happiness due to a mental comparison between the present that is dominated by evermore automated products and the past that reflects experiences which have been gathered over years by using the products. As such, automation may disconnect nostalgic consumers' experience of driving the car on their own. In contrast, consumers low in nostalgia (i.e., those rather oriented toward the future) may actually derive happiness from automation since they do not feel a strong

connection to past manual driving experiences but rather appreciate the benefits of the automation. Taken together, we expect the positive effect of automation on the perceived hedonic value of the focal activity to diminish with increasing levels of nostalgia. Our arguments suggest a moderated mediation as follows:

H3: Perceived hedonic value of the focal task mediates the effect of automation on perceived happiness such that the indirect effect is positive for people low in nostalgia, but negative for people high in nostalgia.

3.2 Method

We used the same commercial consumer panel to recruit an effective sample of 173 participants from Germany (58.4% female, median age 42) to participate in this online experiment using a one-factorial (driving function: automated vs. not automated) between-subjects design. Participants received a cover story about a trip to California that involved them driving from San Francisco to Los Angeles on the famous Highway 1. In the automated condition, the car was presented as modern and fully automated (self-driving), and in the non-automated condition, the car was presented as a modern car but without the automated driving function. After reading the scenario, subjects went on to respond to a short questionnaire. Perceived hedonic value of the focal driving task in the described scenario was measured on a multi-item scale adopted from Voss, Spangenberg and Grohmann (2003) ($\alpha = .90$). Happiness ($\alpha = .94$), nostalgia ($\alpha = .81$) as well as the covariate self-efficacy ($\alpha = .92$) were measured on the same scales as before.

3.3 Results and discussion

The manipulation check for autonomy of the driving function ("This car was 1=definitely not automated, 7=definitely fully automated"; $M_{auto} = 5.42$; $M_{notauto} = 3.11$; $F(1,184) = 69.753$; $p < .001$) indicates that the manipulation was successful in the intended direction. To test H3, we performed a conditional process analysis with perceived hedonic value of driving in the described scenario as mediator and nostalgia as moderator influencing the effect of automation on the mediator.

The results for the regression model with perceived hedonic value of driving in the specific scenario as the outcome ($F(4, 168) = 43.083$; $p < .001$; $R^2 = .506$) show a positive effect of automation (b = 1.67; t = 3.32; $p = .001$). In line with our expectations, the results also reveal a negative and significant automation $\times$ driving task hedonism interaction (b = -.367; t = -2.58; $p = .011$), suggesting that for consumers with high (low) levels of nostalgia, the positive

effect of automation on driving hedonism is reduced (enhanced). Another floodlight analysis (Figure 2) shows that the simple main effect of automation is positive and significant for nostalgia values lower than 3.621. For larger nostalgia values the positive simple main effect of autonomy turns insignificant and eventually reverses but remains insignificant due to a large standard error. For extremely high levels of nostalgia, however (the scale maximum of 7), there is a trend in the data for a negative effect (b= -.900, t = -1.638, p = .103).
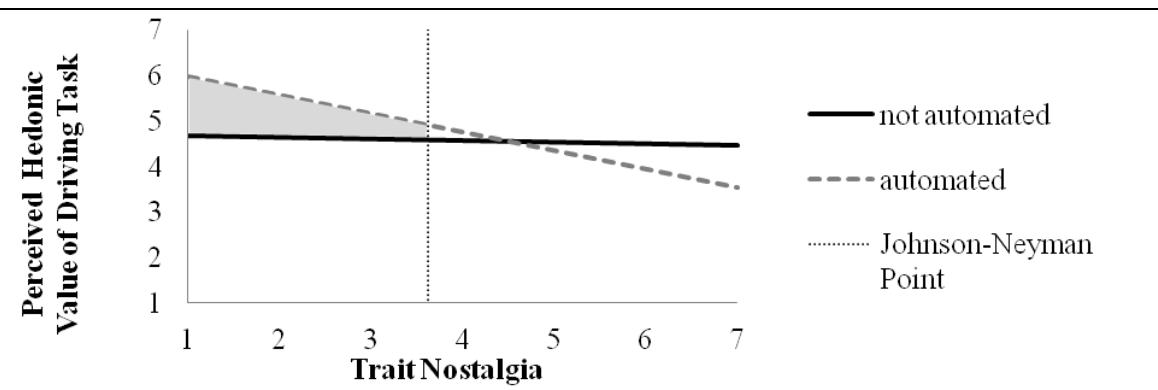

Figure 2. Floodlight Analysis (Car Study)

The results for the regression model with happiness as the outcome ($F_{(3, 169)} = 118.949$; $p < .001$; $R^2=.679$) show a trend in the data towards a positive direct effect of automation (b = .27; t = 1.89; $p = .061$) and a positive and significant effect of perceived hedonic value in the specific driving scenario (b = .60; t = 9.673; $p < .001$).

The results also suggest a moderated mediation such that for low levels of nostalgia (2.22 or 1SD below the mean of 3.31), the indirect effect of automation on happiness through driving hedonism is positive (.512) and significant (95% CI [.228, .823]). At the mean of nostalgia, the indirect effect is .271 and significant [.077, .470] and for high nostalgia (4.41 or 1SD above the mean) the indirect effect is .029 but no longer significant with a 95% CI including zero [-.308, .335]. As such, the indirect effect is not negative as hypothesized in H3, but generally in line with our expectation implied in H3 that the effect is less positive for consumers high in nostalgia compared to their low nostalgia counterparts.

4. General Discussion

This research is among the first to investigate consumer reactions to automated products. As we have shown, these types of products can serve as means to increase anticipated happiness by satisfying an individual's need for hedonism. However, based on the focal product aspects consumers could react very differently on the automation of these.

Investigating this area, we contribute to the consumer research literature by examining the impact of perceived hedonism on the favorability of automated consumer goods. We further show that automation may alter the perceived hedonic value of a task. Second, by introducing the moderating role of nostalgia on perceived hedonism we extend the literature on experiential consumption. The construct of nostalgia could be an integral part in understanding why consumers accept or deny an automated good.

Future research should try to validate these findings further by also conducting lab or field experiments to observe actual consumer reactions. In doing so, also the perception to release resources should be measured by investigating actual consumer behavior in an experiment setting to avoid demand effects. Additionally, in order to derive more meaningful implications on the role of automation within the context of experiences further experiments should be conducted which put more emphasis on the consumers' perception of the actual experience rather than simply the automated task and the attitude towards this task. In doing so, also a broader range of manipulations (i.e. a two-factorial design manipulating perceived hedonism or priming nostalgia) should be applied to further illuminate the relationship between these constructs. Last, self-efficacy has been integrated as a covariate into both experiments. Since the potential loss of control could serve as an alternative explanation of the findings future research should investigate this construct further within this research stream.

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