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# Choose as Much as You Wish: Freedom Cues in the Marketplace Help Consumers Feel More Satisfied With What They Choose and Improve Customer Experience

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Consumer satisfaction and customer experience are key predictors of an organization's future market growth, long-term customer loyalty, and profitability but are hard to maintain in marketplaces with abundance of choice. Building on self-determination theory, we experimentally test a novel intervention that leverages consumer need for autonomy. The intervention is a message called a "freedom cue" (FC) which makes it salient that consumers can "choose as much as they wish." A 4-week field experiment in a sporting gear store establishes that FCs lead to greater consumer satisfaction compared to when the store displays no FC. A large ( $N = 669$ ) preregistered process-tracing experiment run with a consumer panel and a global e-commerce company shows that FCs at point-of-sale improve consumer satisfaction and customer experience compared to an equivalent message that does not make freedom to choose any amount salient. Perceived freedom mediates the effect. FCs do not change the time spent or clicks on the website overall but do change the focus of the choice process. FCs lead to greater focus on what is chosen than on what is not chosen. We discuss practical implications for organizations and future research in consumer choice.

## Public Significance Statement

Consumer satisfaction and customer experience are difficult to maintain in marketplaces where there is abundance of choice, especially when consumers have no external constraints on how much to purchase. The present research suggests that simple point-of-sale messages reminding consumers that they are free to choose "as much as they wish" improve their customer experience and satisfaction. These messages are easy for organizations to incorporate into online or physical stores.

**Keywords:** freedom cue, customer experience, consumer satisfaction, field study, process tracing

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Consumer satisfaction and customer experience are key intangible assets for organizations, especially in times when product market competition is high and financial market uncertainty is large (Gramling et al., 2021; Luo et al., 2010). Consumer satisfaction in particular predicts key performance metrics like an organization's

future market growth, long-term loyalty, and profitability (Rego et al., 2013).

A context where consumer satisfaction is particularly difficult to maintain is marketplaces where there is an abundance of choice and consumers feel choice overload (e.g., Iyengar & Lepper, 2000;

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Supplementary materials accompany the online version of this article and contain the study materials. The public preregistration of the main online study is available at <https://aspredicted.org/mk525.pdf>. This specifies how we determined our sample size, all data exclusions (if any), the study design, the study questions, and the analysis plan. Data and code are available upon request.

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Reutskaja et al., 2020; Schwartz, 2000), especially when they have no external constraints on how much to purchase (Wertenbroch et al., 2020). The ability to choose as much as wished from among large selections is characteristic of many real-world settings, even when consumers enter a store with a shopping list (Suher et al., 2019). Finding solutions that can improve consumer satisfaction and customer experience in these problematic settings is therefore important, especially for organizations that offer an ample range of products or services. Our aim is to add to the body of literature of interventions that improve consumer satisfaction in the presence of abundance of choice. The medium- to long-term significance of improving consumer satisfaction for organizations has already been well documented in the literature and is therefore outside of the remit of this investigation. For reference, increased satisfaction and customer experience have been shown to improve business sustainability (Becker & Jaakkola, 2020; Leischnig et al., 2011; Lemon & Verhoef, 2016), future revenue, performance, customer loyalty, and differentiation from the competition (Moore, 2012; Pekovic & Rolland, 2020; Pine & Gilmore, 2011).

### Conventional Solutions for Increasing Satisfaction With Large Assortments in Stores

Traditional solutions to improving consumer satisfaction in the presence of large ranges of products or services include recommendations to reduce assortment sizes (Boatwright & Nunes, 2001) or information load (Fasolo et al., 2007). The disadvantage of these solutions is that they require retailers or web designers to alter the structure of the assortment presented. Additionally, while smaller assortments may cause less overload for consumers who want to purchase, smaller assortments may also attract less traffic (Iyengar & Lepper, 2000), which is not a desirable outcome for businesses.

Another conventional solution is to display recommendation signs that focus consumer attention on special deals, new arrivals, or best sellers. These recommendation signs are ubiquitous but on occasion have been shown to be unhelpful when there is a lot of choice because they can increase consumer search and difficulty (Goodman et al., 2013). Importantly, signs like “best sellers” might also backfire because they create the expectation that some options should be chosen over others, and according to self-determination theory (SDT, Deci & Ryan, 2000), this frustrates the need for autonomy, which consumers value (Patall et al., 2008; Wertenbroch et al., 2020).

### SDT and Consumer Need for Autonomy

SDT (e.g., Deci & Ryan, 2000) posits that people have three basic psychological needs: autonomy, competence, and relatedness. When these needs are fulfilled, the intrinsic motivation toward a certain task increases and positively impacts individual performance, engagement, well-being, and quality of experience. To be fulfilled, these needs require a supportive context. Contexts vary in the extent to which they naturally support or frustrate the fulfillment of these basic psychological needs. SDT researchers have shown this across a wide range of domains, including education, organizations, sport and physical activity, religion, health and medicine, parenting, virtual environments and media, close relationships, and psychotherapy.

Research on the need for autonomy looked at how controlling versus autonomy-supportive environments impact functioning, well-being, performance, and persistence, across many domains. For instance, field studies in schools and organizations (e.g., Deci et al., 1989) have found that providing autonomy support in real-world settings improves outcomes such as greater intrinsic motivation, enhanced well-being, and—key to our theorizing—*increased satisfaction*. Empirical studies of SDT have shown that autonomy-supportive (noncontrolling) contexts positively affect intrinsic motivation and outcomes because they influence the extent to which people perceive autonomy while engaged in an activity, which suggests an important mechanism—*perceived autonomy*. For instance, Reeve and Deci (1996) have shown that in a supportive/noncontrolling context participants had greater intrinsic motivation than in a controlling context and that participants’ perceptions of their own autonomy mediated this effect. In the SDT literature (e.g., Deci & Ryan, 2010), freedom and autonomy are used interchangeably. For example, Reeve and Deci (1996) measured perceived autonomy using the item “How much freedom did you feel?”

SDT research in the consumer choice domain has lagged behind compared to other domains. Within the scant literature, the study by Patall et al. (2008) made an important contribution by showing that a shopping environment with recommendation signs threatens consumers’ autonomy need. Our research further contributes to work at the cross-section between consumer choice and SDT by testing an intervention that shopping environments (like retail stores and websites) can adopt to better support their consumers’ basic need for autonomy.

### A Novel Solution Inspired by SDT: Freedom Cues

In line with SDT (Deci et al., 1989; Deci & Ryan, 2010), we propose a novel intervention that can *fulfill* (rather than frustrate) consumers’ need for autonomy in shopping environments where there are no external constraints on how much to purchase. The intervention is in the form of a “freedom cue” (FC) which is a message that makes it salient to consumers that they can choose as much as they wish. Based on Deci et al. (1989), we expect that this message will make a shopping environment more autonomy-supportive and, as a result, positively impact consumers’ satisfaction. Further, and consistent with Reeve and Deci (1996), we expect that the effect of the FC on satisfaction is due to an increased sense of perceived freedom while choosing. In other words, we expect that perceived freedom mediates the effect. As in Reeve and Deci (1996) and Wertenbroch et al. (2020), we refer to “autonomy” and “freedom” interchangeably, and see Botti, Iyengar and McGill (2023) for choice freedom as an antecedent of autonomy.

Our intervention has similarities with autonomy-supporting messaging interventions in health care settings. For instance, messaging that validates decision-makers’ perceived autonomy has been shown to increase positive behavioral outcomes and engagement in health care settings (e.g., Gillison et al., 2019; Moon et al., 2021). Similarly, experience sampling research has shown that autonomy over one’s choice of activities improves immediate experiences (greater perceived meaningfulness, engagement, and positive affective balance) in the context of solitary activities (Tse et al., 2022). To the best of our knowledge, no one has yet investigated an autonomy-supportive intervention to boost consumer satisfaction and customer experience. This is our intended contribution to the SDT and consumer choice literatures.

In line with SDT and the need for autonomy in particular (Moller et al., 2006), we expect that in an environment that displays FCs, consumers will be more satisfied with what they choose and have better customer experience than in a situation where they have the same actual freedom but no cue that triggers this need for autonomy. By making it salient that consumers have the freedom to choose as much as they wish without making any direct recommendation about what specific option to choose (e.g., a best seller or a discounted product), we expect that FCs will not backfire as other conventional solutions have (Goodman et al., 2013; Patall et al., 2008) by increasing time spent, amount of information searched for, or difficulty of choosing.

### Overview of the Studies

The first aim of this research is to investigate experimentally whether FCs have a positive effect on consumer satisfaction and customer experience in two common marketplace settings where consumers generally have no external constraints on the amounts they may buy. Our second aim is determine the mechanism by which this effect occurs and examine the impact of FCs on the decision process.

The experiments were conducted in a sporting gear store (field study) and on a website selling reusable face masks (main online experiment with mouse-tracking). Both studies had the following characteristics: They were run in collaboration with commercial partners; consumers made actual purchases or preorders and thereby had realistic budgetary constraints (i.e., choices were consequential); consumers could choose any amount above zero from large assortments and from meaningful product categories (sporting gear and reusable face masks).

The field study piloted the novel effect of the FCs on satisfaction in a brick-and-mortar setting. The main online experiment replicated and extended the findings to customer experience. The online experiment used mouse tracking to explore the effect of the FCs on decision process. Approval from the London School of Economics Research Ethics Committee was granted prior to the data collection (application No. 13653). The main study was preregistered.

#### Field Study: FCs in a Sporting Gear Store

The field study aimed to pilot the feasibility of adding a FC to a brick-and-mortar store, without the interference of an experimenter, and to establish experimentally whether adding it to the signage displays could improve the satisfaction of the shoppers. The study was run in Italy in collaboration with the basketball gear store *Triple*. The store management team was blind to the specific hypotheses of the study, remotely instructed about the content of the FC to be displayed and left free to implement it in a way they considered feasible and sustainable.

#### Materials and Design

Together with the store manager, we identified four consecutive weeks in which there would be the same product availability and no end of season sale. To minimize survey demand and avoid drawing attention to signage being placed and removed, as well as disruption or extra work for the store assistants, the store displayed the FC for 1 week at a time, from Monday before the store opened until Sunday

after the store closed. To ensure maximum randomization given the constraints posed by the field setting, the 4-week period was divided into the experimental FC, Weeks 1 and 3 (in total 13 days), and the “natural choice” (NC) control when no FC was presented, Weeks 2 and 4 (in total 14 days). Apart from the addition of the FC, the store was the same throughout the 4 weeks.

The FC message was printed on posters that were created by the store manager and read “choose any products you want” (in Italian, “Scegli tutti i prodotti che vuoi”). This message is a FC because it aims to make salient the autonomy and freedom consumers naturally have in marketplace settings that do not constrain the number of products consumers can choose. The design of the FC poster was decided by the management team such that it matched the store colors and style and would not artificially stand out from the rest of the store. More specifically, the poster was printed in A4 and A5 sizes with a basketball-orange background and written in bold capital case (see Figure 1B) to be like other signage in the store. The store manager placed 20 FC posters inside the store, at the cash register and on the shelves or walls next to each product category.<sup>1</sup> No FC posters were displayed on the external store windows. The store kept all other promotional messaging displayed (e.g., discounts and special offers) in place for the entire duration of the study (FC and NC weeks).

#### Procedure

One hundred forty-eight shoppers participated in the field study ( $M_{age} = 31$ ; 17.6% female). To participate, they had to be at least 18 years old, speak Italian (since the FCs were written in Italian) and make no purchases on behalf of a basketball team.

The cashier (blind to the experimental hypotheses) invited customers upon paying to participate in a very short consumer satisfaction survey on an iPad. Those who accepted received a short questionnaire asking about their satisfaction with their purchase (using a 7-point Likert scale from 1 = *not at all* to 7 = *extremely*), requesting basic demographic data, and offering entry in a weekly lottery to win a 50-Euro *Triple* gift card. At the end of the 4 weeks, *Triple* provided us with the daily recorded data consisting of number of receipts, number of products sold, and average receipt amount in Euros. At the end of the study, four participants (one for each of the 4 weeks of the study) were selected at random and awarded the 50-Euro *Triple* gift card. Data/coding from the field study are available upon request.

#### Results

Analyses were conducted with SPSS v 27 (IBM Corporation, 2020) and STATA v 15 (StataCorp LLC, 2021). Satisfaction was computed from the buyers who agreed to participate in the survey and who shopped during the 14 days that the store did not display any FC ( $N_{NC} = 54$ ) and those who shopped during the 13 days in which the store displayed the FC ( $N_{FC} = 94$ ). Because there was no reliable measure of traffic in the store during the weeks of the study, we cannot draw meaningful conclusions from the seemingly larger buyer base with the FC.

<sup>1</sup> The store offers 14 different product categories (e.g., basketball shoes, socks, T-shirts, basketballs, shorts and pants, tank tops, etc.). Most had 20 items, with a range from 1 to 82 items for each product line.

**Figure 1**  
*Field Study Photos*



*Note.* FC = freedom cue; NC = natural choice. Taken during the NC Control weeks (A) and the FC Experimental weeks (B). See the online article for the color version of this figure.

**Satisfaction With the Purchase.** Buyers who shopped when the store displayed the FC were, as expected, more satisfied with all they bought ( $M_{FC} = 6.87$ ,  $SD = 0.34$ ) than buyers in the NC condition,  $M_{NC} = 6.72$ ,  $SD = 0.45$ ,  $t(146) = -2.30$ ;  $p = .023$ ,  $\eta^2 = 0.03$ .

**Number of Receipts Per Day.** This was not significantly different when the shop displayed the FC ( $M_{FC} = 17.31$ ,  $SD = 10.95$ ) or did not,  $M_{NC} = 12.07$ ,  $SD = 7.58$ ,  $t(25) = 1.45$ ;  $p = .158$ ,  $\eta^2 = 0.08$ .<sup>2</sup>

**Number of Products Bought Per Day.** This was not significantly different when the shop displayed the FC ( $M_{FC} = 27.92$ ,  $SD = 22.34$ ) or did not,  $M_{NC} = 19.93$ ,  $SD = 13.17$ ,  $t(25) = 1.14$ ;  $p = .264$ ,  $\eta^2 = 0.05$ .

**Average Receipt Amount (In Euros) Per Day.** This was not significantly different when the shop displayed the FC ( $M_{FC} = 65.98$  Euro,  $SD = 8.93$ ) or did not,  $M_{NC} = 69.19$  Euro,  $SD = 16.32$ ,  $t(25) = 0.61$ ;  $p = .547$ ,  $\eta^2 = 0.02$ .

## Discussion

The results of the field study demonstrate that the FC increased the shoppers' satisfaction with their purchases as compared to the natural setting the store offers its customers. The effect cannot be explained by greater amounts purchased, less money spent, or different from usual purchases made. This field study also shows the practical feasibility of the FC in an applied context with customers that had real budgetary constraints and with store staff that had neither support nor interference from an experimenter on site.

The lack of impact of the FC on immediate sales is not surprising. Research shows that higher customer satisfaction increases an organization's future market growth, long-term customer loyalty, and profitability, *over time* (Rego et al., 2013). This lagged benefit

was not measurable in our field study and is outside of the remit of our work.

Also, by design, a field study affords less controllability and insight into the key driver of this effect than does a controlled experiment. For instance, while it would have been methodologically desirable during the control weeks to display a "control cue" with an equivalent message that made choice salient but did not focus on the freedom to choose any amount, adding this cue was not feasible (the store effort would have doubled with creating control posters and placing them in exactly the same locations as the FC). As a result, the field study does not allow us to conclude if the effect of the FC is driven by the salience of freedom to buy any amount or the mere presence of the term "choose" in the message. According to Madan et al. (2020), among others, a prompt to choose may have, inadvertently, prompted a *choice mindset* (the proneness to construe actions as choices) and as such, affected consumer satisfaction (irrespective of the effect of making the freedom to choose any amount salient). Also, a survey-based field study makes it impossible to measure the impact of the FC on individual consumer choice processes.

To overcome the first drawback, our main experiment will present cues in both the FC and NC conditions. The cues are matched in the prompt to choose, but only the FC makes the freedom to choose any amount salient. To overcome the second drawback, we focus on an

<sup>2</sup> For this and all other nonsignificant results, we used the TOST (or Two One-Sided Tests) simple equivalence testing approach (Lakens et al., 2018; Schuirmann, 1987) to understand if the null effect is likely to be due to lack of power or lack of significance. This analysis shows that the results could have failed to reach significance due to lack of power, if the smallest effect size of interest were 0.25. The same occurs for the other two measures (number of products and average receipt).

online consumer setting where the purchase process and outcomes are tracked with high precision and reliability.

### Main Experiment: FC in a Reusable Masks Ecommerce Website

The aims of the main experiment were to replicate the findings of the field experiment in a more controlled experimental setting, to determine the driver of the effect, to rule out the confounding of the absence of a message in the control condition, and to assess the effect of the FC on the decision-making process. Our expectations, study design, and analysis plan were preregistered. To ensure the study could satisfy the goal of greater experimental control without compromising on applied relevance, it was conducted online in collaboration with a U.K. consumer panel provider and VistaPrint, a global eCommerce company selling online reusable face masks.

### Materials and Design

In this experiment, consumers were randomly assigned to FC and NC conditions. Both conditions displayed a message that prompted them to “choose.” By keeping the prompt to “choose” constant across the two conditions, we expected that both FC and NC participants would be in a similar choice mindset, prompted to make choices according to what they wanted/wished, “contingent on [their] own preferences, goals, intentions, [and] motives” (Markus & Kitayama, 2003, p. 7). Any difference we find between the conditions would then be due to the “non-choice” part of the experimental message, which we argue is about the freedom to choose any quantity (i.e., “as much as” wished/wanted).

Another important factor controlled for in this experiment was the price and number of the products in the assortments. The field study included all the basketball gear present in the store, which ranged in price (from 10 euros for a Triple branded facemask to 192 euros for a pair of Nike basketball shoes) and in assortment size (from 1 to 82 products per product line). No product was excluded deliberately to be able to determine the effect in the field where consumers naturally have a range of budgets and preferences. The main experiment

focused instead on a single assortment of 30 face masks, all equally priced reusable textiles. Keeping the assortment size constant and the price equal across items and across conditions was critical to establish the key driver of the effect of the FC independent from these other contextual factors.

The main study aimed not only to replicate the effect of FC on satisfaction but also to determine their effect on customer experience (Chun et al., 2017). Further, to determine the driver of the effect, as in Reeve and Deci (1996) and other SDT literature focused on the need for autonomy, our study included a measure of perceived freedom to test its mediating role for the effect on satisfaction and experience. The item was adapted from Reibstein et al. (1975).

Last, to explore the effect of the FC on the decision process, we used a technique called mouse tracking (Schulte-Mecklenbeck et al., 2017). This technique allowed us to measure the choice process as it unfolded in real time before consumers made a choice. To trace the process that participants used to make their choices, our mouse tracking experiment was programmed by a professional company (<https://expilab.com>; see supplemental material). The mock experimental store webpage displayed the 30 masks available for choice in a 6 × 5 grid. As is customary in mouse-tracing research, the information about the choice options (the mask images) was not fully revealed but covered with a blurred layer. Participants could see only one mask at a time. To clearly see a mask, participants needed to place the mouse cursor over the mask image (see Figure 2A, B). While the mouse was over the image, the mask was displayed. Whenever the mouse was moved off the image, the information closed and the mask blurred again. Every in-page interaction (e.g., mouse-over the cell) was recorded with 1-ms timestamp resolution. This allowed us to track two process measures of interests: the number of mouse-overs (“clicks”) and the time spent on various items (from time spent on each cell to the total response time, in milliseconds).

We counted as clicks all mouse-overs longer than 250 ms (according to literature on eye-fixation duration; Salvucci & Goldberg, 2000; Wedel & Pieters, 2008). Mouse-overs shorter than 250 ms were considered to be “passes” too short for the purpose of this article. From these measures, we computed the fraction of time and clicks on chosen versus nonchosen masks. Process-tracing

**Figure 2**  
*Main Process-Tracing Experiment*



*Note.* FC = freedom cue; NC = natural choice. Face mask shopping website with process tracing in the NC control condition (A) and the experimental FC condition (B). See the online article for the color version of this figure.

literature shows that greater time and number of gazes on chosen items (rather than nonchosen) reflect greater attention, focus, and value amplification during the choice (Smith & Krajbich, 2018, 2019). Longer gazes on stimuli not only reflect preferences but also raise preferences for them (Shimojo et al., 2003).

Though mouse tracing is higher on process distortion than overt or covert eye-tracking is (Riege et al., 2021; Schulte-Mecklenbeck et al., 2017), mouse tracing had advantages for the purpose of this study: Mouse tracing was easier to set up to collect data from remote participants in an online website and provided the appropriate time resolution required for the purposes of the study. This allowed us to shed light on potential mechanisms behind the choices. Mouse-tracking, as any other process-tracing method, can help understand what happens *prior* to choice. Self-reports might not always be accurate about the process of choosing due to boundness of memory, inability to explain one's own actions accurately, or simply reluctance to report the reasons explicitly. Process-tracing can reveal what participants *actually do* before they make their choices. Thus, mouse-tracking helped understand the process that FC and NC participants followed before they made their choices and how the choice processes differed between the conditions.

Tracking the mouse movements of participants allows to go beyond the outcomes or postchoice feelings and obtain granular data that would be very difficult, if not impossible, to obtain with self-reports or with the observation of behavioral outcomes (e.g., choices). Based on mouse movements, which are a proxy for eye-fixations, our task was to "identify the consumer's strategy from only what is observable" (p. 561), consistent with the suggestion of Russo (1978). In sum, the main experiment aimed to replicate the field study findings in a different setting, with a different sample and product category, and with additional customer experience and process measures to control for potential confounds, as well as to explore the process behind the mechanism.

## Procedure

Eight hundred four U.K. participants from the online consumer panel <https://pureprofile.com> were recruited for this experiment. Similar to the choice experiments in Iyengar and Lepper (2000), and as per preregistration, we recruited only consumers interested in reusable face masks. Before reading the instructions, all participants tried the process-tracing tool on a practice task (see supplemental material).

All participants then received the following instructions that convey no external constraints on amount to choose:

you will be able to buy the face masks you are about to browse and select! The site sells also other products, including Christmas cards, photobooks and wall calendars, if you wish to buy something else too.  
... *There are enough masks of any model, and you can buy multiples of each model.*

To mirror natural online shopping, participants could open the masks as many times as they wanted to and take as much time as they needed and select multiple quantities of the same model from a drop-down menu (with a maximum of 10 per model). Across the two conditions they, therefore, had the *same actual* freedom to choose any mask they wanted. All participants were also given the *same actual choice set* (a large assortment of 30 masks, randomly presented in a grid of 6 × 5). They were told to choose at least one

mask, and that each mask cost £5 and all masks had the same quality and safety features, differing only in textile pattern.

In the NC condition, participant instructions concluded with "shop as you would in a real online store for stylish reusable face masks." In the FC condition, participant instructions concluded instead with "You are free to browse and select as many models and quantities of reusable face masks as you wish!"

Next, all participants proceeded to their choice webpage. FC participants saw the same FC message as in the field study ("Choose as many masks as you wish"; see Figure 2B) on the page that displayed the grid of 30 masks. The FC popped up 20 s after participants started shopping. NC participants saw the control message ("Choose as you would in a real store," see Figure 2A) in the same locations as in the FC condition. It also popped up 20 s after participants started shopping. The look and display of the page was programmed to be professional (see details in supplemental materials).

After participants made their choices, they answered a brief questionnaire. In addition to the regular credit for participation, participants had a chance to win a £200 coupon redeemable on the website of VistaPrint, our online retail partner, toward the purchase of the masks they had selected—and any other items from the same online retail store (e.g., photobooks and wall calendars). This lottery was included to render the task realistic and incentive compatible. At the end of the study, we selected one participant at random and awarded the £200 coupon.

## Measures

**Consumer Satisfaction.** We assessed consumer satisfaction experienced during the process of choosing (1 = *not at all* to 9 = *very much*).

**Customer Experience.** We measured customer experience during choice using four items adopted from Chun et al. (2017). We assessed the extent to which participants found their shopping experience enjoyable/fun/good and the extent to which they liked it (1 = *not at all enjoyable/fun/good, did not like at all* to 9 = *very enjoyable/fun/good, liked very much*). We then aggregated this in a consumer experience index (average of these four items).

**Perceived Freedom.** In line with SDT experiments that test mechanisms behind the effect of autonomy-supportive environments (e.g., Reeve & Deci, 1996), we measured perceived freedom during the process of choosing (1 = *not at all* to 9 = *very much*) to explore it as a mediator for the effect of the FC on consumer satisfaction and consumer experience. Reibstein et al. (1975) used a similar single 6-point Likert item to measure perceived decision freedom, "How much freedom did you feel you had in selecting a flavor of soft drink?" (1 = *very little*, 6 = *very much*).

**Process Tracing: Time, Clicks, and Focus on Chosen Products.** Process-tracing data, as defined in Schulte-Mecklenbeck et al. (2017), are time-dependent predecisional observations that allow a glimpse at the process before choices are made. We measured: (a) total time on the choice page (reading text, opening mask photos, selecting masks, etc.); (b) total time spent clicking; and (c) total number of clicks on masks during the choice task. We also measured the number of different mask models clicked, without multiples.

**Choice Outcomes and Variety Seeking.** Choice outcomes were (a) the total number of products chosen (including multiples of

the same model) and (b) variety seeking, as measured in Levav and Zhu (2009) using the ratio equivalent to (number of different models of masks chosen)/(total products chosen, including multiples of the same model). As in Levav and Zhu (2009), we calculated this variety-seeking ratio only for participants who chose more than one product. This variety-seeking index was important as it allowed us to check if the FC message made participants more or less “variety seeking” in their choices. According to the extant literature, variety seeking is the tendency of individuals to seek diversity in their choice of services or goods (Kahn, 1995; Kahn & Wansink, 2004) and is driven by a fundamental need for variety and diversification.

**Additional Variables.** We also collected additional data for exploratory purposes (see supplemental material), to measure any impact on organizational measures demonstrated to correlate with satisfaction—but over a period of time. These included self-reported likelihood to return to the store, to recommend the store, and to share information about the store. We also measured the extent to which participants desired to win the lottery, how likely they would be to wear the masks, or how happy they would be to wear the masks and to answer extra questionnaires to help the researchers. The results are reported in the supplemental material.

**Exclusion Criteria.** As per preregistration, we only targeted 40–59-year olds.<sup>3</sup> Further, we excluded participants who: (a) found the masks in the choice set unattractive (attractiveness < 5, measured by “How attractive did you find the mask selection?” 1 = *not at all* to 9 = *very attractive*) and, as in the marketplace, would not want to purchase them; (b) performed the task in less than 3 min, to ensure serious task participation (a pilot showed that 3 min was the minimum needed); and (c) did not mouse-over a single mask before making a choice. The analysis is on the data from the 669 participants that fulfilled these criteria (323 in FC and 346 in NC; 59% females; age group 40–49 years = 41%; age group 50–59 years = 59%).

See the supplemental material for how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study, and any additional information on the study procedure, practice task, sample, FC condition implementation, subsidiary, and exploratory analyses on additional measures relevant to digital businesses, and discussion about potential effects of mouse tracking on the decision process. Data/coding are available upon request.

## Results

**Consumer Satisfaction, Customer Experience, and Perceived Freedom.** FC participants were, as expected and similar to the field study, significantly more satisfied,  $M_{FC} = 7.76$ ,  $SD = 1.43$ ;  $M_{NC} = 7.45$ ,  $SD = 1.61$ ;  $t(667) = 2.56$ ,  $p = .011$ ,  $d = 0.2$ , than NC participants. The FC increased perceived freedom as participants reported feeling freer when the FC was present ( $M_{FC} = 8.32$ ,  $SD = 1.20$ ) than when they had a message that made choice salient but did not emphasize the freedom to choose all they wanted,  $M_{NC} = 8.10$ ,  $SD = 1.34$ ;  $t(667) = 2.15$ ,  $p = .032$ ,  $d = 0.17$ .

To test if the effect of the FC on consumer satisfaction was mediated by perceived freedom, we ran a mediation analysis. Figure 3 (left panel) shows the complete mediation model with the significant effect of the FC on perceived freedom, a, the significant effect of perceived freedom on consumer satisfaction, b, the total effect of the FC on satisfaction, c, and the direct effect of the FC on consumer satisfaction, controlling for perceived freedom, c', which was not significant. The effect of the FC on satisfaction is therefore completely

mediated by perceived freedom. We tested the significance of the indirect effect (i.e., a × b: the effect of the FC on satisfaction that passes through perceived freedom) using a Sobel test (Sobel, 1982). The results show that perceived freedom significantly mediates the relationship between the FC and consumer satisfaction ( $z = -2.38$ ,  $p = .017$ ). Approximately 74% of the effect of the FC on consumer satisfaction is mediated by perceived freedom.

FC participants also rated their customer experience better than did NC participants. The former found the shopping experience to be: more enjoyable ( $M_{FC} = 7.15$ ,  $SD = 1.56$ ;  $M_{NC} = 6.53$ ,  $SD = 1.80$ ),  $t(667) = 4.77$ ,  $p < .001$ ,  $d = 0.37$ ; more fun ( $M_{FC} = 6.98$ ,  $SD = 1.73$ ;  $M_{NC} = 6.32$ ,  $SD = 2.07$ ),  $t(667) = 4.46$ ,  $p < .001$ ,  $d = 0.34$ ; and better ( $M_{FC} = 7.26$ ,  $SD = 1.56$ ;  $M_{NC} = 6.74$ ,  $SD = 1.81$ ),  $t(667) = 4.02$ ,  $p < .001$ ,  $d = 0.31$ . They also reported liking the shopping experience more than the NC participants did ( $M_{FC} = 7.19$ ,  $SD = 1.63$ ;  $M_{NC} = 6.63$ ,  $SD = 1.94$ ),  $t(667) = 4.02$ ,  $p < .001$ ,  $d = 0.31$ .

We combined these four items in a consumer experience index (Cronbach's  $\alpha = 0.97$ ) and ran a second mediation analysis to test if the effect of the FC on consumer experience was also mediated by perceived freedom. Figure 3 (right panel) shows the partial mediation model: the significant effect of the FC on perceived freedom, a, the significant effect of perceived freedom on customer experience, b, the total effect of the FC on customer experience, c, and the direct effect of the FC on customer experience, controlling for perceived freedom, c', which remained significant. Since c' remained significant after the inclusion of perceived freedom, the effect of the FC on customer experience is partially mediated by perceived freedom. We tested the significance of the indirect effect (i.e., a × b: the effect of condition on experience that passes through the mediator) using the Sobel test. Perceived freedom significantly mediates the relationship between the FC and customer experience ( $z = -2.37$ ,  $p = .018$ ). Approximately 31% of the effect of the FC on customer experience is mediated by perceived freedom.

**Process-Tracing Measures.** For convenience, we present the descriptive statistics for process-tracing variables in Table 1, and then describe the results in more detail below. The FC significantly changed the decision process as it yielded more time spent and more clicks on chosen relative to nonchosen products. With the FC, the ratio of time consumers spent on masks that they chose over time spent on masks they did not choose was greater than with a cue that does not validate this sense of freedom ( $M_{FC} = 0.40$ ,  $SD = 0.29$ ;  $M_{NC} = 0.32$ ,  $SD = 0.26$ ),  $t(667) = 3.70$ ,  $p < .001$ ,  $d = 0.29$ . We found the same result for the ratio of total number of clicks on the chosen items over total number of clicks on the nonchosen items ( $M_{FC} = 0.29$ ,  $SD = 0.23$ ;  $M_{NC} = 0.23$ ,  $SD = 0.19$ ),  $t(667) = 3.92$ ,  $p < .001$ ,  $d = 0.30$ .

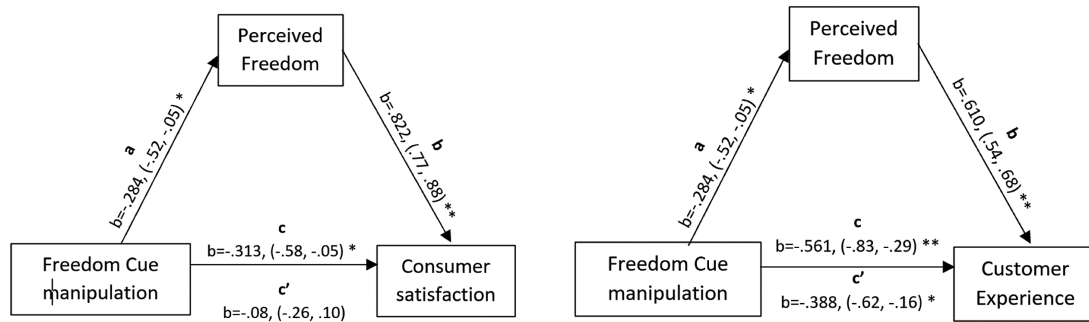
We further report that the absolute amount of time spent (in seconds) and the numbers of clicks made on chosen versus nonchosen masks during the choice task also supports the results described above. First, FC participants spent significantly more time than did NC participants ( $M_{FC} = 13.88$ ,  $SD = 17.38$ ;  $M_{NC} = 11.16$ ,  $SD = 10.71$ ),  $t(667) = 2.45$ ,  $p = .014$ ,  $d = 0.19$  (for logged time regression:  $\beta = -0.17$ ,  $p = .011$ ) and they made significantly more clicks ( $M_{FC} = 11.25$ ,  $SD = 11.97$ ;  $M_{NC} = 9.52$ ,  $SD = 8.09$ ),  $t(667) = 2.21$ ,  $p = .028$ ,  $d = 0.17$  on the masks that they ultimately chose. Second, time spent

<sup>3</sup> We targeted the 40–59 age group because they had an average attitude toward mask wearing and were considered less “extreme” (in contrast, under 40 s were more averse to wearing masks, and over 60 s were more prone than average to wear masks, at the time of our study, Haischer et al., 2020).



**Figure 3**

Main Study: The Effect of the FC on Consumer Satisfaction (Left Panel) and Customer Experience (Right Panel), as Mediated by Perceived Freedom



Note. FC = freedom cue. Regression coefficients are not standardized. 95% Confidence intervals are in parentheses, \*  $p < .05$ . \*\*  $p < .001$ .

on nonchosen items did not differ between conditions ( $M_{FC} = 35.98, SD = 24.36; M_{NC} = 36.75, SD = 24.93$ ),  $t(667) = -0.40, p = .689$  (for logged time regression:  $\beta = -0.01, p = .791$ )<sup>4</sup> but the number of clicks on nonchosen items was higher for participants in the NC than in the FC condition ( $M_{FC} = 39.78, SD = 18.54; M_{NC} = 42.82, SD = 19.21$ ),  $t(667) = -2.07, p = .038, d = -0.16$ .

The total time spent choosing (in seconds) on the face masks page did not differ significantly between the FC and NC conditions ( $M_{FC} = 95.81, SD = 104.58; M_{NC} = 88.59, SD = 54.04$ ),  $t(667) = 1.13, p = .258, d = 0.09$ . The total time spent (in seconds) clicking on masks was not significantly different either ( $M_{FC} = 49.86, SD = 38.63; M_{NC} = 47.91, SD = 32.45$ ),  $t(667) = 0.71, p = .478, d = 0.05$ . FC and NC participants made a similar number of clicks on the masks ( $M_{FC} = 51.03, SD = 27.07; M_{NC} = 52.33, SD = 24.12$ ),  $t(667) = -0.66, p = .512, d = 0.05$ . We also did not find any significant differences in the number of different mask models clicked (without multiples), between the FC and NC conditions ( $M_{FC} = 28.53, SD = 3.87; M_{NC} = 28.33, SD = 4.47$ ),  $t(667) = 0.63, p = .532, d = 0.05$ .<sup>5</sup>

To have greater understanding of the difference in process between the FC and NC participants, we conducted additional analyses<sup>6</sup> on the “re-clicks” on *chosen and nonchosen options*. The number of re-clicks might shed light on the direction of the deliberation of the participants. If FC participants revised the chosen masks more than did NC participants, it would imply that they deliberated more about the options they chose. We compared the number of re-clicks on chosen items (clicking on the same mask for the second, third, and all subsequent times) for participants in the FC and NC conditions. We analyzed the total number of re-clicks on masks bought and the number of re-clicks on bought masks relative to the number of masks bought (i.e., number of re-clicks on bought masks divided by the total number of masks bought). Both measures reveal no difference in behavior of the NC and FC participants. There was a similar number of re-clicks for the both the FC and NC conditions ( $M_{FC} = 6.91, SD = 10.39; M_{NC} = 5.91, SD = 6.24$ ),  $t(667) = 1.52, p = .130, d = 0.12$ <sup>7</sup>. The ratio measure did not differ for the FC in comparison to the NC participants either ( $M_{FC} = 1.59, SD = 1.45; M_{NC} = 1.66, SD = 1.25$ ),  $t(667) = -.680, p = .497, d = -0.05$ <sup>8</sup>. Thus, we do not find any evidence that the participants revised or deliberated over the chosen masks more often in the FC than in the NC.

Last, we analyzed the number of re-clicks on *nonchosen masks* to understand whether participants deliberated more about the options they left behind and did not choose. Here we found that the number of re-clicks on nonchosen masks for the FC was marginally smaller than the number of re-clicks on nonchosen masks in NC conditions ( $M_{FC} = 15.59, SD = 17.52; M_{NC} = 18.09, SD = 17.83$ ),  $t(667) = -1.83, p = .068, d = -0.14$ ). However, the difference did not reach the traditional threshold of .05 significance level.

**Choice Outcomes and Variety Seeking.** The number of total masks bought was not significantly different between the two conditions ( $M_{FC} = 8.28, SD = 9.02; M_{NC} = 7.76, SD = 9.52$ ),  $t(667) = 0.72, p = .473$ <sup>9</sup>,  $d = 0.05$ . We also computed the variety-seeking index to measure whether the FC made participants more “variety seeking” (meaning that they bought more models that were different from one another or “unique” relative to the total number of items bought) than participants with the NC cue. The variety-seeking ratios were not significantly different:  $M_{FC} = 0.75, SD = 0.31; M_{NC} = 0.72, SD = 0.33$ ),  $t(667) = 1.48, p = .139$ <sup>10</sup>,  $d = 0.12$ .

## Discussion

With greater experimental control, our main study replicates the effect established in the field: Consumers report higher satisfaction when the shopping environment supports the need for autonomy and displays a cue that makes their freedom to choose as much as wished salient. The effect of this cue is mediated, in-line with SDT, by a

<sup>4</sup> For all these nonsignificant analyses, we ran TOST analyses that suggest the results might be underpowered if the smallest effect size of interest were 0.25.

<sup>5</sup> The results show that they could have failed to reach significance due to lack of power, if the smallest effect size of interest were 0.25.

<sup>6</sup> These analyses were not preregistered and were suggested by the reviewing team.

<sup>7</sup> TOST analyses suggest that the results could have failed to reach significance due to lack of power, if the smallest effect size of interest were 0.25.

<sup>8</sup> Here, TOST shows equivalence, that is, the true lack of the effect.

<sup>9</sup> TOST analyses show that the results could have failed to reach significance due to lack of power, if the smallest effect size of interest were 0.25.

<sup>10</sup> TOST analyses here show that the test is likely to show a true lack of effect.

**Table 1**  
*Process-Tracing Measures From the Main Experiment*

Dependent measure	NC condition	FC condition
Time consumers spent on chosen masks over time spent on nonchosen masks (ratio)	0.32 (0.26)	0.40 (0.29)
Number of clicks on chosen mask over total number of clicks on nonchosen masks (ratio)	0.23 (0.19)	0.29 (0.23)
Time spent on chosen masks (s)	11.16 (10.71)	13.88 (17.38)
Clicks on chosen masks	9.52 (8.09)	11.25 (11.97)
Time spent on nonchosen masks (s)	36.75 (24.93)	35.98 (24.36)
Clicks on nonchosen masks	42.82 (19.21)	39.78 (18.54)
Total time spent on the face masks page (s)	88.59 (54.04)	95.81 (104.58)
Total time spent clicking on masks (s)	47.91 (32.45)	49.86 (38.63)
Number of clicks on masks (total)	52.33 (24.12)	51.03 (27.07)
Number of clicks on different mask models (without multiples)	28.33 (4.47)	28.53(3.87)
Number of re-clicks (clicking on the same mask for the second, third, and all subsequent times) on chosen masks	5.91 (6.24)	6.91 (10.39)
Number of re-clicks on chosen masks over the total number of masks chosen (ratio)	1.66 (1.25)	1.59 (1.45)
Number of re-clicks on nonchosen masks	18.09 (17.83)	15.59 (17.52)

*Note.* FC = freedom cue; NC = natural choice; s = seconds. Standard deviations are in parentheses.

heightened feeling of perceived freedom while shopping. FCs also positively impact customer experience: With the FC, consumers rate the customer experience as better (the choice process as more enjoyable, more fun, better, and more likable) than in the NC condition. The effect of the FC on customer experience is also mediated by perceived freedom, though partially.

The study has intriguing findings about the differences in process followed by FC and NC participants. Though the instructions in the FC condition encouraged consumers to browse and choose as many items as they wished, we did not find any evidence that this required more time or encouraged them to make more clicks than consumers with a matched cue that invited them to choose but did not make freedom to choose any amount salient.

Importantly, although the number of different mask models clicked did not differ between conditions, the FC *shifted* the decision process prior to their selections. The fraction of time participants spent and the number of clicks participants made on the products that they ultimately chose (and therefore liked more) rather than those left behind (and liked less) was significantly greater with a cue that validates freedom. This pattern suggests the interlink between the focus of attention prior to choosing and forming preferences and is consistent with previous findings where participants gaze longer at what they choose (Shimojo et al., 2003). Stronger attentional focus on items that FC participants finally chose could be the primary explanation for the higher satisfaction and more positive customer experience in the FC than the NC condition.

However, our results also suggest a second explanation. More clicks on nonchosen alternatives and marginally stronger deliberation about nonchosen alternatives in the NC (vs. FC) condition measured through re-clicks could also have yielded lower satisfaction and customer experience for NC participants in comparison to those with the FC. While the participants in the FC condition focused relatively more attention on items that they liked and chose, the NC participants focused more attention (greater number of clicks) and revised marginally more (greater number of re-clicks) the items that they did not choose. The greater focus on “lost”/“foregone” alternatives in the NC than in the FC condition could have contributed to the lower

satisfaction in the NC than in the FC condition if they developed “attachment” to the options that are not chosen (Carmon et al., 2003). A possible different explanation consistent with these data is then that, while the NC condition focuses attention on forgone alternatives, the FC cue shifts the goal or general strategy and triggers more of an acceptance strategy (with the focus on the chosen items) than a rejection strategy (Shafir, 1993).

Though our design does not allow us to tease apart these explanations, we believe that the first (greater focus on chosen items in the FC in comparison to the NC condition) is a stronger explanation for our effect than the second (greater focus on nonchosen items in NC in comparison to the FC condition). While the total number of clicks on nonchosen items was significantly larger in the NC than in the FC condition, the amount of time spent on nonchosen items in NC was not significantly higher than in FC and the number of re-clicks was only marginally higher in NC than in FC.

Because the number of masks chosen and variety-seeking ratios are similar in the FC and NC conditions, it is unlikely that the effect is due to other explanations known in the literature, like variety-seeking (Kahn, 1995) or simply buying more. Future studies could be designed to compare the effect of these potential explanations and identify which has a stronger influence on satisfaction and customer experience. These studies could include measures of attractiveness of options (before and after choice) to find out if participants focus more on the “positives” of choice (i.e., chosen items) in the presence of FCs, and more on the “negatives” (i.e., on nonchosen or lost and forgone alternatives) without FCs.

## General Discussion and Conclusion

From a theoretical standpoint our results contribute to research at the cross-section between consumer research and SDT. Within SDT, the effect of environments that support the basic need for autonomy on optimal functioning and greater psychological well-being of consumers has been established across several domains, for example, education and health (e.g., Deci & Ryan, 2000). We now

add to this body of knowledge an important domain that has been largely neglected—consumer choice.

A second theoretical contribution is to the fascinating new literature on choice mindset as an intervention (e.g., Ma et al., 2019). Choice mindset is a lens that increases the perception of actions in terms of “choices.” Its activation has been associated with a number of positive individual outcomes, for instance in negotiation settings. The FC manipulation in our field study is similar to a choice mindset manipulation because it is likely to make consumers view their shopping actions in terms of choices. Our main experiment was designed to control for the effect of the choice mindset (if at play) by comparing the FC condition with a matched condition that also made people think in terms of choice—but without making it salient that one has freedom over the amount to be bought. In contrast, choice mindset researchers typically manipulate choice mindset by comparing a choice condition with no-choice or constraint conditions. Our work suggests that a choice mindset may have different consequences depending on whether choice is paired with a FC or not. Future research on choice mindset could investigate if the positive effect of choice mindset (e.g., in negotiations, Ma et al., 2019) is boosted by the presence of a FC (e.g., “think of all the freedom you/others have in making this choice”) and whether the negative effects of choice mindset (e.g., in social perception of wealth inequality, Savani & Rattan, 2012) could be mitigated by the presence of a FC.

Third, our process data open a number of exciting avenues for future research at the cross-section of judgment and decision-making and process tracing. Our analysis of the search and time measures suggests that the main difference that adding a FC makes (compared to a condition with choice but no FC) is to increase the relative focus on chosen, and/or decrease the relative focus on nonchosen options. There are a few different accounts for this mechanism, which we encourage future research to address. One is that the FC could shift the attention of consumers toward options that they then choose, more so than with a choice prompt that has no FC. Through this increased attention the FC cue could also shift the goal or general strategy of consumers and trigger more of an *acceptance* (vs. *rejection*) strategy (Shafir, 1993) because the FC participants focus their attention more on chosen (i.e., “accepted”) options rather than nonchosen ones. There is very little research on the effect of acceptance/rejection frame on decision strategy and consumer satisfaction (except for Machin, 2006) that can help us interpret this result.

On the other hand, our data on total clicks and re-clicks are consistent with the alternative explanation that a message that encourages choice but does not highlight freedom to choose as much as wished (the “NC message”) makes people focus more on foregone options relative to a FC. Based on Carmon et al. (2003), the fact that NC participants focus on foregone options more could make them feel more dissatisfied than FC participants because they feel greater loss of the foregone alternatives. This research cannot tease apart whether the FC increases satisfaction and consumer experience in comparison to NC through focus on chosen items, or whether the absence of the FC (in NC) decreases satisfaction due to focus on nonchosen alternatives. To thoroughly test and compare these competing process explanations, we encourage studies that can detect whether the FC increases attention on accepted/chosen alternatives and shifts a choice strategy toward acceptance (thus positively influencing satisfaction and customer experience), or

whether the absence of the FC shifts the attention to nonchosen items and increases the feeling of loss of nonchosen alternatives.

Last, our work speaks to research on predecisional attention and value of options. According to Suri and Gross (2015), greater predecisional attention improves consumer motivation by increasing the value of the options that are attended to. An association between value and attention also emerges from eye-tracking research (Krajbich & Rangel, 2011; Reutskaja et al., 2011; Smith & Krajbich, 2018). For instance, Smith and Krajbich (2019) suggest that gaze or attention amplifies the value of the item one looks at. According to this literature, our process tracing data suggest that the FC, by increasing the predecisional attention to options that are then chosen, could additionally increase the actual value of the chosen options. In addition, Shimojo et al. (2003) suggest that longer gazes on stimuli not only reflect preferences but also raise preferences for them. This could then be responsible for the greater satisfaction of FC participants compared to NC participants. According to literature on the free-choice paradigm (e.g., Brehm, 1956; Shultz et al., 1999) a boost of the value of a chosen alternative (after the choice) is consistent with cognitive dissonance theory. However, this has been mainly established when measuring the boost of value *after* the choice task was complete. Our data suggest that this boost of value on the option that is chosen happens in the predecisional stage of browsing through different possible options. To understand this process fully, future studies should consider measuring how participants value the attractiveness of each option before a FC is presented and after the choice is made.

## Implications for Organizations and Practice

Our research has important implications for organizations that want to increase the satisfaction and experience of consumers who can choose any number of services or products from a large selection. The results show that it is possible to boost consumer satisfaction and customer experience by simple and cheap interventions that retailers or service providers can create on their own, for instance, a poster for a wall or a pop-up for a website. This matters because being able to increase the satisfaction and customer experience today can, in the medium- to long-term, significantly improve an organization’s ability to differentiate its business from others (Blackman et al., 2020), enhance future performance, and strengthen customer loyalty (Becker & Jaakkola, 2020; Lemon & Verhoef, 2016; C. Meyer & Schwager, 2007; Pekovic & Rolland, 2020).

The mechanism whereby our intervention works is by supporting consumers’ need for autonomy and boosting perceived freedom during the choice process. This makes our intervention different from conventional recommendation signs that typically focus consumer attention on special deals, new services or products, or popular and recommended options. These common techniques threaten consumers’ need for autonomy by directing consumers toward a particular product, which creates the expectation that some options should be chosen over others and diminishes consumers’ feeling of self-determination and autonomy (Patall et al., 2008).

## Limitations and Future Research Directions

Our studies have limitations that can further inform directions for future research. Turning to the main effect of the FC, we

acknowledge that the largest effect is on customer experience and satisfaction with the choice process. The effect on purchases and exploratory measures like recommendation of the store was not the focus of this work. When analyzed, we found this to be not significant, possibly because of lack of power or because we measured it immediately after the intervention. Our suggestion is to conduct larger studies over a longer period time to reveal any interesting impact that occurs after the FC and to capture return to the store and loyalty over time, as traditionally measured in this literature.

Larger studies could also help determine if the effect generalizes to different sub-populations with different disposable incomes and for products with different costs. At present our field study shows that the effect is not limited to an artificial lab setting and holds in natural conditions where shoppers make real consumption decision from products that range in cost. Future research can examine this more systematically.

A second limitation concerns the type of products we focused our research on (sport gear items and facemasks). Future research needs to broaden the type of products and services that consumers choose (e.g., utilitarian products or food items). While our contribution has been targeted to consumer research because it is a domain where autonomy-supportive interventions have not been widely examined, we encourage a test of consequences of a FC in other nonconsumer choice domains where there is abundance of choice. Because we hypothesize that the FC would improve the satisfaction and experience of the *choice process* itself (rather than the products directly), we expect that the FC effect will generalize to these other domains, for instance choosing exercise classes on a gym app or extracurricular activities. The question of whether the FC directly affects the ultimate experience of the product itself (be it a consumer product or exercise class) is also an interesting one that this research opens avenues to.

Another limitation of the online study is that, upon advice of a professional designer consulted to ensure applicability of our intervention in the field, we used a different font to display the message on the choice webpage (the rest of the website and button text was in identical font for the FC and NC conditions). In particular, the FC message was programmed in Kalam cursive font (equivalent to Free Ink in Word), whereas the NC message was programmed in the Open Sans font. Previous research has demonstrated that information in hard-to-read fonts (e.g., Comic Sans Italicized) is better remembered than easier to read fonts (e.g., 16-point Arial; Diemand-Yauman et al., 2011). Indeed, the disfluency (i.e., the subjective, metacognitive experience of difficulty associated with cognitive tasks) produced by fonts that are more difficult to read leads individuals to process information more deeply (Alter et al., 2007) and more carefully (Song & Schwarz, 2008), which translates in a better comprehension of the information read (Corley et al., 2007). Interestingly, with disfluent material people were found to rely more on systematic reasoning processes and less on heuristics (Alter et al., 2007). Although previous research on the effect of different fonts on cognitive processes was mostly conducted in educational settings, with limited number of font types, and has not been reliably replicated (A. Meyer et al., 2015), the different font used in the two messages may have played the role of a confounding variable. Further research is needed to replicate and extend the finding of our study, as well as to better disentangle the role of different font types on the considered dependent variables.

Future studies could also more precisely tease out if the effect of the FC is due to the presence of terms like “wish” and “want” in the manipulation. In our two studies, we chose to use “wish” and “want” interchangeably due to a prevalent norm in marketing. For instance, Chen et al. (2017) describe “pay as you *wish*” as a “curious pricing mechanism that lets consumers decide what a product is worth to them and how much they *want*” (p. 780, emphasis added). Conversely, Kim et al. (2009) include the keywords “pay what you *want*” and “pay as you *wish*.”

From an analytical perspective, we chose to use as mediator a single item of perceived freedom, as in previous research. Future research should consider a larger battery of items for perceived freedom to avoid concerns over discriminant validity and the construct being perceived as too close to the independent variable (Zhao et al., 2010).

Finally, our studies were conducted in Western cultures where a choice mindset is more prevalent (Savani et al., 2010) and choice freedom is both advocated for and found to be detrimental (Markus & Schwartz, 2010). While SDT and the need for autonomy have been demonstrated as equally important in the East by a large study with over 90,000 students from the Program for International Student Assessment (PISA, Nalipay et al., 2020), future research needs to consider the generalizability of the effect of the FC in different cultures that may value choice differently.

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