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The importance of perceived fairness in product customization settings

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ABSTRACT

Customization tools enable computerized service interactions that increase customer value. This value is affected by customers' co-creation efforts. During the customization process, customers weigh the cost of their resources (e.g. ideas, time, knowledge) against the resources invested by a service company (e.g. online support, product warranty) to evaluate the fairness of the process. This study examines how customer satisfaction is affected by perceptions of fairness during the customization process, as well as the number of customization options offered by a customization tool. Two experiments show that, regardless of the number of customization options, customers always evaluate a company more positively when the customization process is fair. Product category involvement and customer expertise also moderate the relationship between customization and satisfaction. As this research indicates, customization must be designed carefully to avoid undesirable marketing outcomes.

Introduction

Customization is a reliable way to deliver superior customer value (e.g. Franke & Hader, 2014; Salvador et al., 2009; Schreier, 2006). Mass customization enables customers to design individually tailored products and services that the manufacturer then produces to order (Franke et al., 2010; Piller, 2004). Recent research shows that consumers' evaluation of the relational objectives in the customization experience depends on their perceptions of perceived control during the mass customization process and calls for a deeper exploration of the relational benefits derived from (mass) customization (Turner et al., 2020). The tools that enable such processes generally involve automated service interactions that increase customer value by enabling those customers to create products that meet their individual needs, through technology-enhanced experiences (Flavián et al., 2019). In the sports industry for example, almost all major sports brands, such as Adidas, Nike and Puma offer online customization tools that enable customers to design products by choosing colors, designs, cushioning, linings, levels of support, and material.

Prior studies indicate many benefits of mass customization offers that lead to positive outcomes, such as increased preference fit and positive customer experiences (de Mattos et al., 2019; Franke & Schreier, 2010; Robertson et al., 2012; Schnurr & Scholl-Grissemann, 2015; Schreier, 2006). However, less is known about their potential drawbacks for customers, such as increased complexity, choice burdens, and the need to invest considerable time and effort (Stokburger-Sauer et al., 2016). Customers might also lack personal preference insights (Dellaert & Stremersch, 2005; Huffman & Kahn, 1998; Salvador et al., 2009). In customization settings, customers typically serve as partial employees and become partially responsible for the outcome (Büttgen et al., 2012).

The customization process can be characterized as a social exchange process, even when the provider is physically absent or replaced by an automated service tool such as a chatbot. Social exchange refers to 'voluntary actions of an unspecified nature that extend beyond basic role obligations and suggest a personal commitment to the partner' (Bettencourt, 1997, p. 387). Customers form perceptions regarding the fairness of these actions (Cropanzano et al., 2002) and evaluate outcomes according to their perceptions of the fairness of the exchange relationship (Blodgett et al., 1997). Theories of justice (Greenberg & Folger, 1983; Sparks & McColl-Kennedy, 2001) and fairness (Folger & Cropanzano, 1998) come into play here. While justice theory often distinguishes between three dimensions (i.e. procedural, interactional, and distributive justice; Colquitt, 2012; Cropanzano et al., 2002), fairness theory (Folger & Cropanzano, 1998) incorporates the three dimensions of justice to derive at a holistic understanding of fairness (Törnblom & Vermunt, 1999; Yani-de-Soriano et al., 2019). Customers, therefore, weigh the personal resources they use during the customization process (e.g. ideas, time, knowledge) against the resources invested by the service company (e.g. online support, product warranty) to derive at an overall perception of fairness.

According to fairness theory, accountability for any perceived unfairness is fundamental (Folger & Cropanzano, 1998) that is, if customers believe that their resource expenditure is higher than the company's, they are seeking for someone to blame and are, thus, likely to form negative perceptions about the service company. This perception affects outcomes. If the customer regards the company's contribution as disproportionately less than his or hers, leading to a loss of time resources or delays for the customer, he or she will sense unfair treatment (Katz et al., 1991). The perceived fairness of a service directly affects company evaluations, such as customer loyalty and satisfaction (Hibbert et al., 2012; Oliver, 1977; Roggeveen et al., 2012), so a customer's overall fairness perception should contribute considerably to his or her assessment of the customization process, as well as customer evaluations of the service company. It is thus important to determine whether customers who believe they are being treated unfairly are less satisfied with the company than customers who sense the fairness of the customization process.

Research has shown that in a service context, the number of choices and the amount of effort and time customers invest in customization forms an inverted u-shaped relationship with company success measures (Stokburger-Sauer et al., 2016). However, we do not know how the quantity of customization settings relates to fairness perceptions. It is also unclear how a customer's invested time and effort interacts with fairness perceptions when there are more customization options. As such, research on consumer fairness perceptions in the context of customization is scarce. Our research thus elaborates on the relational

perspective of customization (Turner et al., 2020) by linking the customization concept to consumers' fairness perceptions and, thereby, expanding, this research stream.

When participating in customization, both the customer's level of product category involvement or interest in the product category (Stokburger-Sauer & Hoyer, 2009) and the customer's level of expertise, reflecting the cognitive structures and processes required to perform product-related tasks (Alba & Hutchinson, 1987), are critical resources. Customers with high levels of product involvement and expertise, better preference insights, and more knowledge about how to customize a product are more active and successful in customization tasks (Franke & Hader, 2014; Hunt et al., 2012; Hunt et al., 2013). We therefore investigate the moderating effects of product involvement and customer expertise on the relationship between customization options and customer satisfaction with the service company. High levels of these traits may mitigate the effects of the perceived personal costs that arise from having many customization options.

By linking the concept of customization to justice theory (e.g. Greenberg & Folger, 1983) and fairness theory (Folger & Cropanzano, 1998), our overarching goal is to investigate whether customization options (i.e. many vs. few) and the perceived overall fairness of the customization process (i.e. fair vs. unfair) affect customer satisfaction in a customization setting in which no personal interaction with the service company takes place. Furthermore, we examine the mitigating effects of product involvement and customer expertise on the relationship between customization options and satisfaction. This research thus contributes to theory by integrating the concept of perceived fairness into the literature streams related to mass customization and service recovery. It also contributes to practice by showing that customization settings are only successful when carefully designed to avoid customer perceptions of exploitation or other undesirable marketing outcomes.

Theoretical background and hypotheses

Fairness in computerized service interactions

Justice theory (Sparks & McColl-Kennedy, 2001) and fairness theory (Folger & Cropanzano, 1998) help to explain the mechanism that determines how many personal resources customers are willing to invest in customization tasks. Both theories have been applied in marketing and service research to understand customer reactions to service outcomes, most notably in the field of service recovery. Justice theory posits that customer satisfaction and loyalty depend on whether customers perceive the service company treats them fairly and whether they have obtained justice (McColl-Kennedy & Sparks, 2003).

An ongoing debate about the conceptualization of justice usually differentiates three dimensions: *Distributive justice* refers to the perceived fairness of outcomes; *procedural justice* refers to the fairness of the decision-making process; and *interactional justice* refers to the quality of the interpersonal interactions (Cropanzano et al., 2002; McColl-Kennedy & Sparks, 2003), which in turn can be separated into interpersonal justice (i.e. respect and propriety rules of justice) and informational justice (i.e. justification and truthfulness rules of justice) (e.g. Colquitt, 2012). Researchers have not yet specified whether and how the justice dimensions are related though. Although early research regarding social justice described procedural and interactional forms as the formal and social

aspects of the same construct (e.g. Greenberg, 1990; Tyler & Bies, 1990), later research has challenged this view (Cropanzano et al., 2002). The primary argument for a distinction between constructs is that they have different consequences. Within organizational justice research, procedural justice mainly applies to the exchange between a person and the employing organization, whereas interactional justice primarily refers to the exchange between a person and his or her supervisor (Cropanzano et al., 2002).

Fairness theory (Folger & Cropanzano, 1998) incorporates the three dimensions of justice and posits that the assignment of blame is central to social justice. In addition, it predicts that negative fairness perceptions occur because of the influence of accountability on the three justice dimensions. That is, for any injustice that occurs, someone is to blame (McColl-Kennedy & Sparks, 2003). Törnblom and Vermunt (1999) argue that fairness is perceived holistically, and the components of fairness can only be assessed in relation to overall fairness. As such, an overall conceptualization of fairness requires the combination of all three justice dimensions (Ambrose & Schminke, 2009.; Holtz & Harold, 2009; Lazauskaite-Zabielske et al., 2019; Yani-de-Soriano et al., 2019).

We use a compensatory model to arrive at an overall, global perception of fairness (Ambrose & Schminke, 2009; Blodgett et al., 1997; Holtz & Harold, 2009). Accordingly, we refer to a single fairness dimension to investigate the effects of customers' overall fairness perceptions and the behavioral outcomes of the customization process in a computerized service encounter. This overall perception of the fairness of the customization process directly influences subsequent behaviors, such that customers' overall evaluations of the inputs and outputs of the customization process influence their evaluations of service quality.

The majority of studies of fairness or justice and customer participation deal with service recovery in online and offline environments, such as technology-based self-services or automated service experiences (e.g. Casado-Diaz & Nicolau-Gonzalbez, 2009; Dabholkar & Spaid, 2012; Dong et al., 2008; Heidenreich et al., 2015). The results reveal that technology-based self-services should be designed and programed to handle problems during customer use to avoid negative attributions, such as perceived unfairness. Regarding research on computerized service interactions, Zhou (2012) and Zhu and Chen (2012) were among the first to explore the role of fairness and trust in internet banking. Despite the lack of service provider and customer personal interaction in internet banking, perceived fairness still has positive effects on consumer satisfaction. Fairness (as one factor of integrity) is also found to be a significant source of trustworthiness, particularly when the service user is unable to evaluate quality prior to receiving the service (Isaeva et al., 2020). In the context of consumers' privacy perceptions in a retail environment, consumers' acceptance of digital technologies is significantly driven by distributive fairness (i.e. feelings of proportionality between what consumers provide and what they receive in exchange from the retailer) (Pizzi & Scarpi, 2020). Additionally, consumers who perceive the self-service-technology as fair are more likely to increase their future spending with the retailer (White et al., 2012). Research regarding the management of pre-core service wait (i.e. pre-service recovery) reveals, that increasing consumers' fairness perceptions improves satisfaction (Qin et al., 2019). Robertson et al. (2012) also show that customer fairness perceptions can be positively associated with services, such as an easy process of invoking and collecting a guarantee, a helpful frequently asked questions section, or friendly email correspondence.

In the context of product customization, as another form of computerized service interaction, first results from the automotive industry show that the increase in mass customization can lead to declined customer satisfaction of the sales process and highlight the importance of perceived price fairness (Khan & Haasis, 2016). By focusing on the relational objectives of mass customization further research shows how value can be derived from the customization experience. A key finding is that consumers' evaluation of experiences in e-retailing depends on their perceptions of perceived control during the mass customization process (Turner et al., 2020). Research on automated service experiences also highlights that value co-creation is affected by customers' control perceptions and the type of interaction with the service robot (Belanche et al., 2019). Thus customization is a key asset to restore satisfaction, because it enhances role clarity and perceived value.

Customization options and fairness perceptions

Offering a myriad of choices implies that the customer has to invest a considerable amount of time and effort evaluating all options (Salvador et al., 2009). As such, the complexity of customization increases with the number of customization options. Too many customization options could lead to frustration or confusion among customers (Dellaert & Stremersch, 2005; Huffman & Kahn, 1998; Schnurr & Scholl-Grissemann, 2015). Kuskov and Villas-Boas (2010) show that for less important decisions, and when customers believe that companies know their customer base well, customers prefer fewer options. Furthermore, in the context of digital assortments, Piris and Guibert (2019) show online stores with large assortments do not automatically lead to more positive customer attitudes. When customers have too many customization options, the personal cost of evaluating them might outweigh their perceived benefits.

The paradox of choice is a phenomenon that occurs when more options – particularly if they are highly relevant and success is personally important – lead to poorer decisions and decreased satisfaction (Schwartz, 2004). When this situation occurs, customers might decide not to buy or view the service company as undesirable. The invested time and effort in the customization process thus play a pivotal role in successful customization and directly reflect on customers' evaluations of the service outcome (Salvador et al., 2009). That is, choosing from more options affects customers' satisfaction with the company. The more options a customer chooses, the more he or she invests and the less satisfied he or she will be. Choosing from fewer options instead reduces the investment of time and effort, which may increase satisfaction. If too many customization options lead to lower perceived product value, in the sense of input and output relations (Huffman & Kahn, 1998), they should negatively affect the customer's assessment. Furthermore, customers are only willing to engage in customization to a certain point. If they start to believe they are more responsible for the end product than the service company, they likely issue negative evaluations of the service company (e.g. Grissemann & Stokburger-Sauer, 2012; Huffman & Kahn, 1998; Salvador et al., 2009; Stokburger-Sauer et al., 2013). Specifically, if customers perceive they are being treated unfairly during customization, negative effects are likely, such as dissatisfaction with the service company. As such, we propose that the effect of fairness on customer satisfaction varies depending on the customization options available.

With comprehensive engagement in the customization process, customers' expectations of the service company increase. If customers experience an unfair customization process after investing a lot of personal resources, their dissatisfaction will be higher than if they had invested fewer personal resources (i.e. chose from fewer options). Moreover, customer satisfaction should be higher in a setting that is fair but has fewer customization options than in a setting that is unfair but has many customization options (Figure 1). Therefore,

H1. Customers with fewer (vs. many) customization options are more satisfied with a service company when the customization process is perceived as fair (vs. unfair).

Study 1

The objective of Study 1 is to test whether fewer (vs. many) customization options affect customer satisfaction with a service company and whether this satisfaction varies when customers perceive higher (vs. lower) levels of fairness. We use a 2 (customization options: few vs. many) × 2 (customization process: fair vs. unfair) between-subjects design.

Stimuli development

To create the experimental factors, we developed four vignettes describing a sneakers customization tool in which we varied the *customization options* and *fairness of the customization process*. The Appendix details these scenarios. To avoid any biases or halo effects from brand liking, we created a fictitious, start-up sneaker manufacturing company called Style your Sneakers (hereafter, SYS), which enabled participants to customize their sneakers using an online customization tool. We chose sneakers because they are not gender specific, and sneaker customization is common.

In the *many customization options* condition, the sneaker design tool offered many customization options, such as color, shape, and material. The *few customization options* condition only allowed customers to select the sneaker color. The fairness of the customization process, which we define by a single justice dimension to investigate the effects of customers' overall fairness perceptions of the customization processes (e.g.
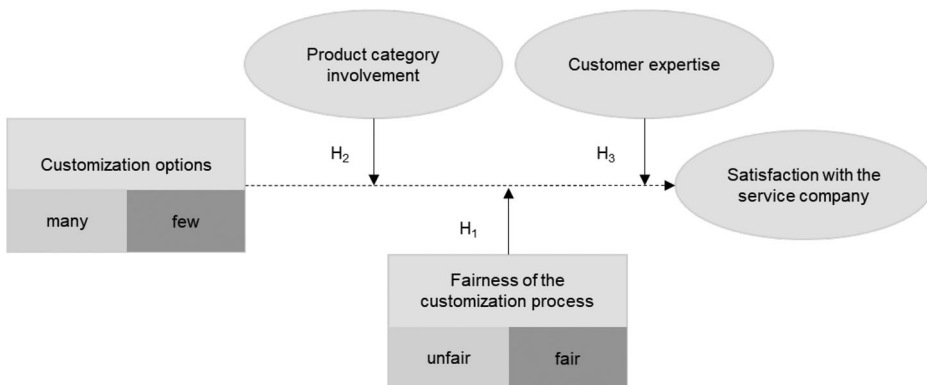
Figure 1. Conceptual Model.

Lazauskaite-Zabielske et al., 2019; Yani-de-Soriano et al., 2019), was manipulated such that in the *fair customization process* condition, the warranty claims, delivery times, and customer support services were the same for customized sneakers and standardized sneakers. Furthermore, the price for customized and standardized sneakers was the same as changing a product's color generally involves no extra cost for the company. Customers owned the rights to the new design. We included the price comparison between customized and standardized products, because customers expect no penalties for their invested time and effort in customization processes (Etgar, 2008). In contrast, in the *unfair customization process* condition, customers could not make any warranty claims, the delivery period for customized sneakers was long, the customer support service was bad, and the price of the customized sneakers was disproportionally higher than the standardized sneakers. In addition, the service company reserved the rights to the design of the sneakers. The two customization conditions and the two fairness conditions were combined to generate four treatments. After reading the vignette, participants were instructed to imagine that they were customers of SYS, then rated their satisfaction with this service company.

Data collection

The study was conducted online using a convenience sample of 164 participants (93 women and 71 men; 72% students, 26.8% employed). Over two weeks, we recruited participants through our Facebook profile, which included an invitation to participate and a link to our online questionnaire. The average participant age was 24.7 years. Participants were randomly assigned to one of the four treatments.

Measures

We used four survey items to assess satisfaction, which was the dependent variable (see Table 1 for measures and reliability tests). The items were measured using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree). We calculated an index using mean values.

Table 1. Construct measures and reliability tests.

	Study 1			Study 2		
	FL	α	AVE		FL	α	AVE
Customer satisfaction (adapted from Fornell et al., 1996)	$M = 3.21$ $SD = 1.69$		.93	.83	$M = 4.96$ $SD = 0.98$		.72	.64
I would be satisfied with the online store SYS.	.92					
SYS would produce the ideal shoe for me. / Fiction snowboards would provide ideal services for me.	.88			.81		
SYS would be the ideal online store for me. / Fiction snowboards would provide ideal services for me.	.94			.81		
An online store like SYS would meet my expectations of an ideal store. / The services of fiction snowboards would meet my expectations of ideal services.	.91			.79		
Product involvement (adapted from Zaichkowsky, 1994)				$M = 5.57$ $SD = 1.49$		.92	.87
I am interested in everything around snowboarding.				.90		
Snowboarding means a lot to me.				.94		
Snowboards are important to me.				.96		

Notes: FL = factor loadings, α = Cronbach's Alpha, AVE = average variance extracted. All factor loadings are significant at *p* < .001.

Results

Manipulation checks

The results showed that both stimuli were successfully manipulated. The customization vignette that included many sneaker design options was perceived as providing significantly more options than the vignette that included few options (M_{many} = 4.87, M_{few} = 4.26, F (1, 162) = 2.99, $p < .10$; 'SYS offers many customization options'). With an item assessing the overall evaluation of perceived fairness, adapted from Voorhees and Brady (2005), we determined that the vignette that described the fair customization process was rated as fairer than the unfair process (M_{fair} = 5.04, M_{unfair} = 2.55, F (1, 162) = 111.33, $p < .001$; 'SYS is fair'). All items were measured using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree).

Hypotheses tests

The data were analyzed using a 2 (customization options: few vs. many) × 2 (fairness of the customization process: fair vs. unfair) analysis of variance (ANOVA), with customization options and the customization process as factors (Table 2). There was a significant main effect of the perceived fairness of the customization process on satisfaction (F (1, 160) = 50.39, $p < .001$). Mean values were higher for the fair interaction (M = 4.05, SD = 1.70) than the unfair interaction (M = 2.56, SD = 1.38). The main effect of customization options on satisfaction was insignificant (F (1, 160) = 1.25, $p = .27$).

In support of H1, the results showed a significant interaction between customization options and fairness of the customization process, which affected satisfaction (F (1, 160) = 52.75, $p < .001$). The effect of many customization options on satisfaction did not depend on the perceived fairness of the customization process (F (1, 80) = .01, $p = .91$). The influence of fewer customization options on satisfaction was higher for the fair process (M = 4.92, SD = 1.31) than the unfair process (M = 1.91, SD = 1.27; F (1, 80) = 109.99, $p < .001$).

Product involvement and customer expertise as success enhancers

In addition to the number of customization options, the customer's satisfaction might depend on customer and product characteristics. Study 2 thus investigates how two customer traits (i.e. product category involvement and customer expertise) moderate the influence of customization options on customer satisfaction. We replicated the experiment

Table 2. Analyses of variance tables.

Study 1	F (1, 160)	p
Dependent variable = satisfaction		
Fairness of the customization process (fairness)	50.39	.000**
Customization options (options)	1.25	n.s.
fairness × options	52.75	.000**
Study 2	F (1, 384)	P
Dependent variable = satisfaction		
Fairness of the customization process (fairness)	7.10	.008**
Customization options (options)	16.02	.000**
fairness × options	3.71	.055°

**$p < .01$. °$p < .10$. n.s. = not significant.

from Study 1 using a technically more sophisticated product (snowboards) and collected additional evidence about potential moderating variables in automated service interactions (Figure 1).

Involvement is the perceived relevance of an object based on personal values, needs, and interests (Zaichkowsky, 1985). Prior literature distinguishes between cognitive and affective involvement (Park & Young, 1986): Cognitive involvement results in higher product knowledge, but affective involvement results in strong emotional engagement. When affective involvement is high, customers have strong emotional ties to the product and might utilize products to communicate their self-concept. Involvement with an object increases a customer's motivation to process information (Petty & Cacioppo, 1979) and encourages product information searches and the evaluation of alternatives (Zaichkowsky, 1985). The level of product involvement reflects customers' interest in the product category (Stokburger-Sauer & Hoyer, 2009).

Prior customization research highlights the importance of product involvement by showing that it positively affects customization activity (Hunt et al., 2012; Hunt et al., 2013). Mass customization research further indicates that, because of a lack of preference insight, customers frequently do not know a priori what their ideal final product should look like (Franke & Hader, 2014). Therefore, interest in the product category is an important prerequisite for successful mass customization. Customers with high levels of product involvement might be more willing to engage in customization and be more satisfied with a company that offers many customization options; they regard the investment of time and ideas not as an inconvenience but rather as enjoyable. Product category involvement thus may moderate the effect of customization options on satisfaction with the service company.

H2. For customers with more product category involvement (vs. less product category involvement), more customization options (vs. fewer customization options) lead to higher satisfaction.

Customer expertise accounts for both the cognitive structures (e.g. beliefs about product attributes) and the cognitive processes (e.g. rules for acting on those beliefs) required to perform product-related tasks (Alba & Hutchinson, 1987). Customers with high levels of customer expertise are better at information processing (e.g. Beattie, 1983) and decision making (e.g. Becker, 1976). In addition, customers require a range of resources, such as knowledge, skills, and social connections, to take a participative role (Hibbert et al., 2012). In mass customization research, Schnurr and Scholl-Grissemann (2015) find that customers equipped with the knowledge and skills necessary for customization enjoy the process more, particularly if there are many options to customize aesthetic attributes (e.g. color, shape). Therefore, customer expertise should help overcome the perceived costs associated with having many customization options (Huffman & Kahn, 1998).

We propose that customers with high levels of expertise are more knowledgeable about how to customize a product and know which aspects can be modified to meet their needs. Thus, expert customers expect the customization tool to provide many options and value a company that provides these capabilities. In a condition with many customization options, these customers with more expertise should be more satisfied with the service company. In addition, the cost of evaluating all alternative options

might be lower for these expert customers, who do not have to invest as much time and effort to choose from numerous options. However, customers with more expertise might be less satisfied with a company that does not offer sufficient customization options. In contrast, novices might be overburdened and unable to use all of the customization tool options, which might result in decreased satisfaction with the service company. Therefore, we hypothesize,

> **H3.** For customers with more expertise, many customization options lead to higher satisfaction (vs. customers with less expertise, for whom fewer customization options result in higher satisfaction).

Study 2

Study 2 uses snowboards as the product category for customization. Customization in the skiing industry occurs frequently, and snowboards are used equally by both genders. As in Study 1, we used a 2 (customization options: many vs. few) × 2 (customization process: fair vs. unfair) between-subjects design.

Stimuli development

We created a fictitious snowboard company, Fiction Snowboards, which provided customers the opportunity to customize snowboards using an online customization tool. The Appendix contains the scenarios. As in Study 1, we developed four vignettes and varied the customization options (i.e. few vs. many) and the fairness of the customization process (i.e. fair vs. unfair). The *many customization options* condition provided a tool that offered many snowboard design options, such as color, shape, material, discs, and plates. In the condition with *few customization options*, customers could only select the snowboard color. We manipulated the *fairness of the customization* condition as in Study 1. After reading the vignette, participants were instructed to imagine that they were customers of Fiction Snowboards and evaluate their experience with the service company.

Data collection

We recruited participants through two popular snowboard websites and from an online alpine snowboarding community. Newsletters from the websites and a post to the online community contained a link to our questionnaire. The questionnaire was available for 10 weeks. Participants were randomly assigned to one of the four treatment groups. The sample consisted of 388 participants (171 women and 217 men; 57.2% students, 27.6% employed), whose average age was 25.6 years.

Measures

The dependent variable, satisfaction with the service company was measured using three items. The moderating variables were *product involvement* and *customer expertise*. We used three items to assess product involvement (construct measures and reliability tests see Table 1). The item used to assess customer expertise came from Mitchell and Dacin

(1996) (i.e. 'Compared with other people, I am very knowledgeable about snowboards'). All items were measured using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree).

Results

Manipulation checks

The manipulation checks showed that both stimuli were successfully manipulated. The customization description with many snowboard design options was perceived as providing significantly more options than the description that included fewer options (M_{many} = 5.56, M_{few} = 5.20, F (1, 386) = 4.54, $p < .05$; 'The service company, Fiction Snowboards, offers many customization options'). As in Study 1, the vignette for the fair customization process was evaluated by one item and perceived as more fair than the unfair process vignette (M_{fair} = 5.14, M_{unfair} = 4.84, F (1, 386) = 4.97, $p < .05$; 'The process with the service company, Fiction Snowboards, is fair'). Again, all items were measured using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree).

Hypotheses tests

The data were analyzed using a 2 × 2 ANOVA, with customization options and the customization process as factors (Table 2). The main effect of the perceived fairness of the customization process on satisfaction was significant (F (1, 384) = 7.10, $p < .01$). The mean values were higher for the fair (M = 5.17, SD = .83) than the unfair (M = 4.92, SD = .94) process. The main effect of the customization options was also significant (F (1, 384) = 16.02, $p < .01$). The mean values were higher for the few (M = 5.23, SD = .85) than the many (M = 4.88, SD = .90) customization options.

These results showed a weak but significant interaction between customization options and the customization process (F (1, 384) = 3.71, $p < .10$). In contrast with Study 1, the effect of few customization options on satisfaction did not depend on the perceived fairness of the customization process for snowboards (F (1, 190) = .28, p = .60; H1 not supported). The influence of many customization options on satisfaction was higher under the fair process condition (M = 5.08, SD = .91) than the unfair process condition (M = 4.67, SD = .85; F (1, 194) = 10.34, $p < .01$). Thus, for a technically more sophisticated product, the highest satisfaction levels can be achieved when a company offers a customization tool with fewer customization options. When customers have an a priori interest for the product (as this was the case for our participants in Study 2), perceived fairness seems to be less important for their satisfaction than when participants do not show such a priori interests (Study 1).

Moderating effects

To test the moderating effects, we calculated two levels (i.e. high vs. low) of product involvement and customer expertise, using median splits. Although some researchers are critical of such calculations for continuous data, Iacobucci et al. (2015) show that median split analyses deliver robust results and do not increase Type I errors when the independent variables are uncorrelated (all correlations are below $r = .12$). Moreover, main effects can be correctly interpreted using ANOVA instead of regression analysis; the latter would be necessary when analyzing moderating effects with continuous

variables (Brambor et al., 2006). In support of H2, product involvement significantly moderated the effect of customization options on satisfaction (F (1, 384) = 3.00, p < .10; Figure 2).

The influence of many customization options on satisfaction was greater for participants high in product involvement (M = 5.06, SD = .91) than for participants low in product involvement (M = 4.67, SD = .85; F (1, 194) = 9.40, p < .01). The influence of few customization options on satisfaction did not depend on product involvement (F (1, 190) = .43, p = .51). Moreover, for customers low in product involvement, fewer customization options (M = 5.19, SD = .83) led to a significantly higher satisfaction level (M = 4.67, SD = .85; F (1, 179) = 17.19, p < .01).

In support of H3, the moderating effect of customer expertise was marginally significant (F (1, 384) = 2.80, p < .10; Figure 3). The influence of many customization options on satisfaction was higher for participants with more customer expertise (M = 4.95, SD = .90) than participants less customer expertise (M = 4.71, SD = .89; F (1, 194) = 3.01, p < .10). The influence of few customization options on satisfaction did not depend on customer expertise (F (1, 190) = .37, p = .55). Moreover, for customers with less customer expertise, few customization options (M = 5.28, SD = .85) led to significantly higher satisfaction levels (M = 4.71, SD = .89; F (1, 121) = 13.41, p < .01).
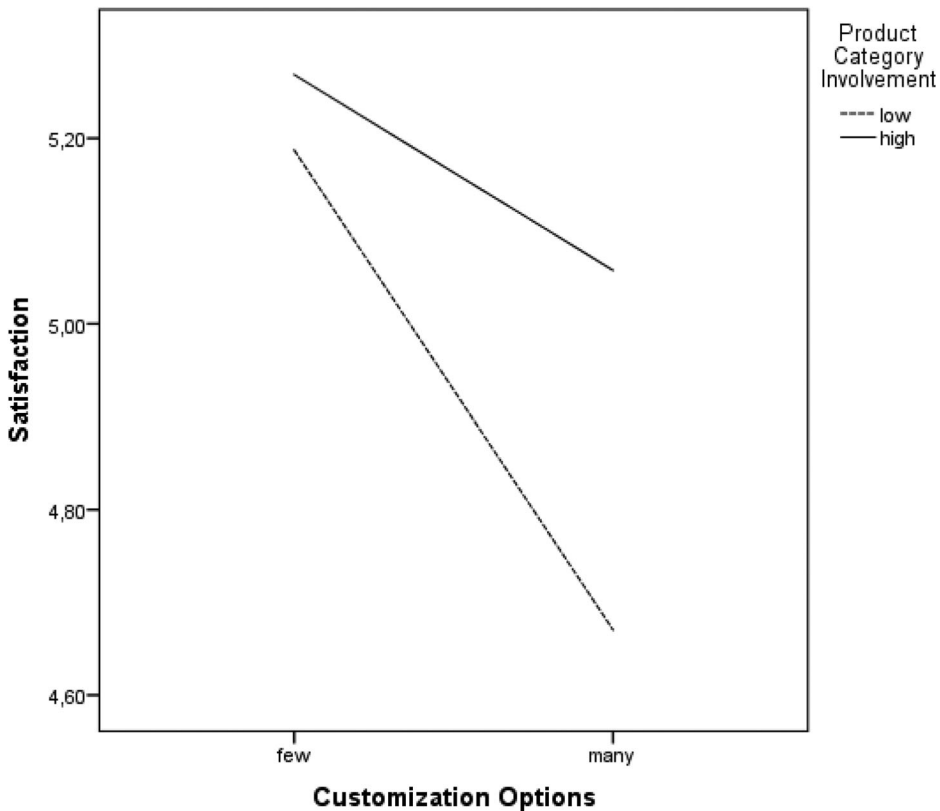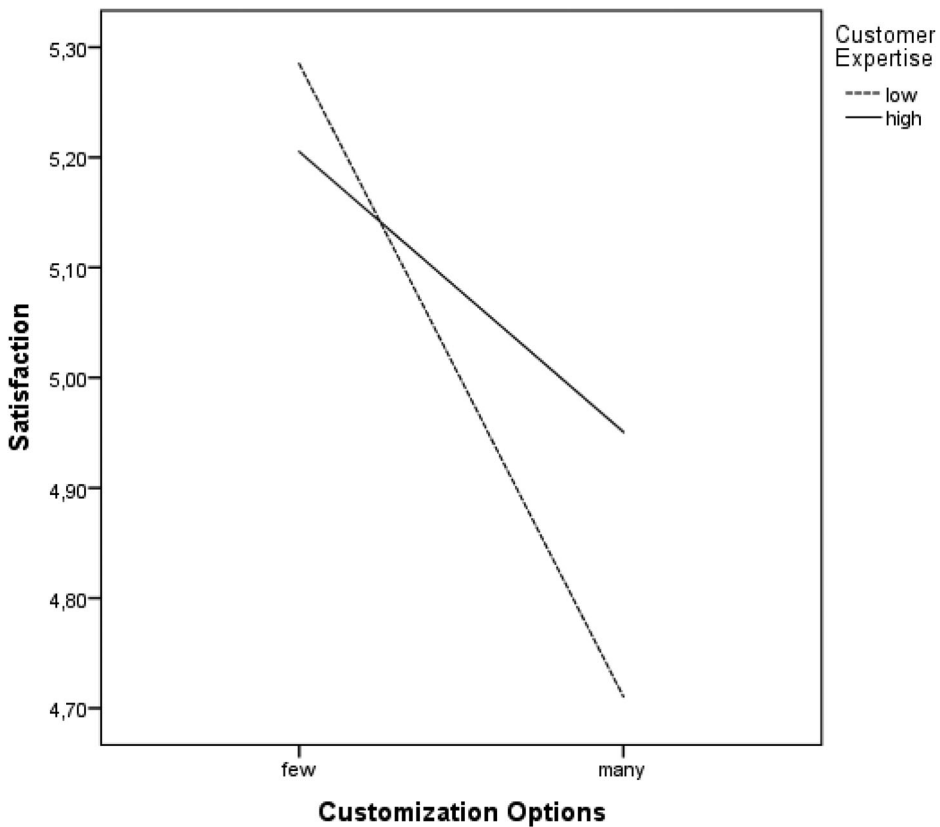

Figure 2. The Moderating Effect of Product Category Involvement.

Figure 3. The Moderating Effect of Customer Expertise.

Theoretical and managerial implications

Theoretical implications

The goal of this research was to extend previous studies on computerized service inter-actions, specifically mass customization tools, and understand customers' fairness percep-tions during the customization process. H1 proposed that customers with fewer customization options would be more satisfied with a service company when the custo-mization process is perceived as fair. As such, we analyzed the effect of customization options, the level of effort and time involved, and the perceived fairness of the customiza-tion process on the evaluation of the service company, according to customers. With our results, we dispute the established assumption that more customization options always lead to more positive evaluations of the service company. Our study shows that the 'less is more' concept (Scheibehenne et al., 2010) also holds in mass customization set-tings. Thus, customization is not a panacea; it must be designed carefully to avoid custo-mer perceptions of exploitation and undesirable marketing outcomes.

Although justice in service recovery research is well developed, its link to customization research is still nascent. As customers increasingly engage in service and product develop-ment (e.g. self-service technologies, customization tools), perceived fairness becomes increasingly important too. Customers are willing to participate in product and service

development only to a certain extent before they feel exploited (Stokburger-Sauer et al., 2016). Incorporating the concept of perceived fairness thus is crucial to specify the number of customization options that customers will accept. Our study showed that customers always rate their satisfaction with a company more positively when they perceive a fair customization process.

In addition, this study contributes to automated service interaction research by outlining the importance of differences in customer traits. In H2 and H3, we proposed that for customers with more product category involvement and more expertise, respectively, more customization options would lead to higher satisfaction. We confirmed that product category involvement and customer expertise moderate the relationship between customization options and satisfaction with the service company. Customers with higher levels of product involvement or expertise were more satisfied with the service company when it offered more customization options. Thus, high levels of these traits can overcome the negative effects stemming from many customization options. This important finding resonates with some previous research (e.g. Dellaert & Stremersch, 2005; Huffman & Kahn, 1998).

Managerial implications

We derive four important managerial implications for computerized service interactions that take the form of customization tools. First, a fair customization process substantially influences the extent to which a customer is satisfied with a company. Regardless of whether there were many or few customization options, customers always evaluated the service company more positively when the customization process was perceived as fair. Of note, the difference in satisfaction between the fair versus unfair condition was particularly high when there were more customization options. Thus, if customers invest many personal resources (e.g. time, effort, ideas) in the customization process, they are less willing to accept missing warranty claims, long delivery periods, or a lack of support. Managers providing customization tools should establish effective customer support, because customization tools do not compensate for bad customer service. Such customer support could be provided for example through chatbots or artificial intelligence.

Second, for a technically sophisticated product such as snowboards, customers showed the highest levels of satisfaction when there were few customization options, independent of fairness, during the customization process. We did not find the same effect for the sneakers category, possibly because the participants viewed customizing many aspects of this product too time-consuming and too complicated, compared with the product they received. Therefore, a customization tool with too many options does not necessarily add value. Managers must carefully design automated service interaction tools, focusing on simplicity and usability and taking into account the product's complexity. Too many customization options for a technically sophisticated product might lead potential customers to refrain from personalizing their products.

Third, a fair process can mitigate the negative effect of too many customization options. Fairness helps overcome the burden of using a tool equipped with many customization options for technically sophisticated products such as snowboards. Customers are still satisfied with companies, as long as they guarantee fast delivery, accept product

returns, provide warranties, and ensure good customer service, even when the company requires the customers to make many decisions themselves. Managers should ensure customers are treated fairly when they invest a lot of time and effort to individualize a complex product.

Fourth, the relationship between customization options and satisfaction with the service company is moderated by the customer traits of involvement and expertise. As the interest of highly involved customers increases, the perceived value of customization options also increases. Customers with high levels of product category involvement are more willing to engage in customization processes and less likely to be discouraged by the increased effort resulting from many customization options. Furthermore, expert customers have superior cognitive capabilities and therefore can handle complex consumption situations, such as customizing a product. Customers with more expertise expect more from a customization tool and are disappointed if fewer customization options are available.

In contrast, if a customer has less expertise, a tool with many options might overburden him or her and lead to termination of the customization process or a more negative evaluation of the service company. From these findings, managers should conclude that computerized service interactions, in the form of customization tools, are only suitable for customers or prospects who are experts in the product category or who show interest in it. Promotional campaigns for such tools therefore should primarily address customers with an interest in or knowledge of the product category, such as by advertising in specialized journals or online forums for special interest groups.

Limitations and further research

This study has limitations that provide opportunities for further research. First, both studies relied on fictitious scenarios in which participants imagined a situation and then responded to questions. This technique contains some natural biases, such as participant motivation and cognitive effort (Schwarz, 1999). A field experiment might provide further insights by measuring actual instead of intended behavior. Second, the use of a student sample in two different settings – general consumers vs. targeted consumers – are additional limitations. Using more representative panel data or real-life customers could be insightful. Third, additional studies might manipulate customization options at three levels (i.e. few, medium, and many options) to tackle the asymmetric relationships with customer response variables. Moreover, manipulating participants' expertise could provide insightful results for the customization process – an issue future research might want to address. Fourth, the use of chatbots incorporated in customization tools should be elaborated. Fifth, studies of computerized service interactions might incorporate financial measures, such as customers' willingness to pay (e.g. Teichmann et al., 2016; Tu et al., 2018). Sixth, it would be informative to include other customer trait variables, such as perceived effort or enjoyment, and test their moderating role in customization settings. Recent customer coproduction research indicates that perceived enjoyment can overcome the negative effect of too much coproduction on outcomes, such as customer loyalty (Stokburger-Sauer et al., 2016). Seventh, future studies should investigate even more complex customization tasks. The study of Khan and Haasis (2016) shows that under mass customization, the buyer is involved in many processes such as picking

choices, opting service and filling forms. Such complex customization processes are more vulnerable to service failure and, therefore, more likely to rise feelings of unfairness.

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Appendix

Scenarios of Study 1

Introduction of scenario descriptions

Please picture the following situation: You are looking for a new pair of sneakers and want to buy them online. *Style Your Sneakers* (*SYS*) is a start-up sneaker manufacturing company with an online shop. It offers an online customization tool that enables you to customize your sneakers. A pair of sneakers from *SYS* costs between €90 and €150, depending on the type of materials used. The delivery time is about one week.

Manipulation: many customization options

When using the customization tool, you learn that materials, colors, imprints, logos, and lettering of the sneakers can be changed. The customization tool, therefore, offers very good possibilities to design your sneakers.

Manipulation: few customization options

When using the customization tool, you learn that only the colors of the sneakers can be changed. The customization tool, therefore, offers limited possibilities to design your sneakers.

Manipulation: fair customization process

You search for online reviews about *SYS* and find reviews that highlight how easy it is to use the customization tool. The *SYS* website offers extensive information such as tutorial videos, sample photos, and extensive information about the materials. In addition, a very competent 24-hour service hotline is offered at no cost.

The customized sneakers are at no extra cost, and the delivery time is the same as for the standardized sneakers. Returns of the customized sneakers are accepted, and a warranty can be claimed. You own the rights to the new design.

Manipulation: unfair customization process

You search for online reviews about *SYS* and find reviews that criticize how difficult it is to use the customization tool. The *SYS* website offers little information about the customization tool. The service hotline is incompetent and at cost.

The customized sneakers cost approx. €50 more than the standardized sneakers, and the delivery time is four weeks longer. No returns of the customized sneakers are accepted, and no warranty can be claimed, and *SYS* reserves the rights to your design.

Scenarios of Study 2

Introduction of scenario descriptions

Please picture the following situation: *Fiction Snowboards* is a new online shop and offers an online customization tool to customize your snowboard. It offers snowboards for all ages and performance classes (i.e. beginners, advanced, and professionals). The snowboards from *Fiction Snowboards* are similar to other high-end snowboards available on the market in terms of materials used and driving characteristics. A snowboard from *Fiction Snowboards* costs between €250 and €450, depending on the type of materials used. The delivery time is about one week.

Manipulation: many customization options

When using the customization tool, you learn that the colors, shapes, materials, discs, and plates can be changed. Furthermore, materials such as carbon and fiberglass can be chosen.

Manipulation: few customization options

When using the customization tool, you learn that only the colors of the snowboards can be changed.

Manipulation: fair customization process

Fiction Snowboards provides good customer service. The customized snowboards are at no extra cost, and the delivery time is the same as for the standard snowboards. Returns of the customized snowboards are accepted, and a warranty can be claimed. You own the rights to the new design.

Manipulation: unfair customization process

Fiction Snowboards provides little customer service. The customized snowboards cost approximately €200 more than the standardized snowboards, and the delivery time is five weeks longer. No returns of the customized snowboards are accepted, and no warranty can be claimed. *Fiction Snowboards* reserves the rights to your design.