Consumer Response to Aesthetic Mass Customization*

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ABSTRACT: Although recent research has explored consumers’ reactions towards mass customization (MC) in general, these studies have considered aesthetic and functional MC as one and the same. In the present article, we focus specifically on consumer response to aesthetic MC because there are some unique factors that influence this type of MC. Providing insights in these factors can help firms in order to more successfully implement aesthetic MC strategies in products. In our research, hypothetical MC configurators were presented to respondents. The configurators were varied and allowed for different extents of aesthetic MC. In addition, the visibility of the mass-customized product elements to others was manipulated. Our findings suggest that customizing a product’s aesthetic features enhances its self-expressive value, which on its turn positively affects consumers’ evaluations of MC and the behavioural intentions (e.g., purchase intention). Furthermore, a greater extent of aesthetic MC increases the perceived complexity of the MC task, which negatively affects evaluation. Finally, visibility of the mass-customized product elements to others enhances the self-expressive value of aesthetically customized products. The article concludes with the implications of these findings for firms interested in pursuing MC strategies.

KEY WORDS: Mass customization, Product design, Aesthetics, Self-identity

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I. INTRODUCTION

Recent developments in information technology (e.g., Web 2.0) are changing the way consumers interact with firms and what they expect from their offerings. In contrast to the traditional one-way relationship, in which consumers are offered standard products or services, firms can now also offer co-created products through mass customization (MC). For example, Dell provides the opportunity to mass customize the technical aspects of computers, Nike allows consumers to design their own pair of sneakers by selecting the colours for the different parts of the shoes, and Timbuk2 offers mass-customized bags by offering consumers the opportunity to select the colours and/or patterns for the different parts of the bag. The examples of Nike and Timbuk2 demonstrate that consumers’ co-creation activities can focus entirely on aesthetics. A key differentiating aspect of MC strategies is that they are built around consumers’ involvement in the design process (Pine II, 1993), while also creating “customized products with production cost and monetary price similar to those of mass-produced products” (Kaplan and Haenlein, 2006, p. 176–177). MC allows consumers to co-design and co-create products that match their individual needs and requirements, and therefore, consumers are willing to pay a premium price for these mass-customized products (Franke, Keinz, and Steger, 2009; Franke and Piller, 2004; Schreier, 2006).

Yet, despite the intuitive strategic merits of MC, MC configurators are still scarce in the marketplace, which indicates that more research on their impact on customer decisions is needed (Hauser, Tellis, and Griffin, 2006). Of course, it would be simplistic to suggest that consumers always prefer MC, or to propose that all products should be mass-customized. Accordingly, there is a need for empirical research to better understand the
antecedents, motivations, and psychological processes that drive consumers’ evaluations of MC configurators and mass-customized products (Kaplan and Haenlein, 2006). Recent research has investigated why consumers appreciate MC and whether they are willing to pay more for such mass-customized products (Franke and Schreier, 2008; Franke, Schreier, and Kaiser, 2010; Schreier, 2006). Furthermore, consumers’ evaluation of MC is found to depend on the MC configurator (e.g., the number and levels of product components that can be customized) (Dellaert and Stremersch, 2005; Franke, Keinz, and Schreier, 2008; Randall, Terwiesh, and Ulrich, 2007) and the characteristics of the consumer (Franke, et al., 2009; Kaplan, Schoder, and Haenlein, 2007). However, past research has focused predominantly on gaining an understanding of MC in general and has thus considered MC of aesthetic and functional features as one and the same, when in fact they are not. In a functional MC configurator, consumers can only select the technical components (e.g., a laptop’s processor speed) of products, whereas aesthetic MC allows consumers to co-create the appearance of the product (e.g., a laptop’s external design). Aesthetic elements are rather subjective, their evaluations are often based on affective reactions, and generally they are more visible to other people. This implies that the MC of a product’s aesthetic features has some unique and important aspects that need to be systematically addressed in order to fully understand how consumers react to and evaluate aesthetic MC. The present research contributes to the literature by addressing this issue. Besides its theoretical contribution, this increased understanding can help managers in new product development to more successfully implement aesthetic MC strategies in products.

The remainder of this article is structured as follows. First, a review of the literature relevant for understanding consumer response to aesthetic MC is provided and several hypotheses are proposed. Then, an empirical study is reported in which respondents were presented with hypothetical aesthetic
MC configurators. The article concludes with a discussion of the findings and provides implications of the present research for managerial practice.

II. THE EFFECTS OF AESTHETIC MASS CUSTOMIZATION

1. Self-Expressive Benefits

Past research has demonstrated that consumers appreciate MC because it allows them to obtain a product that better fits their own unique preferences (Dellaert and Stremersch, 2005; Franke and Piller, 2004; Schreier, 2006). Although both aesthetic and functional MC will result in a greater fit to consumers’ individual preferences, it is likely that the particular benefits that are offered to consumers differ. Specifically, functional MC allows consumers to obtain products that better fit their technical requirements, and will thus deliver functional benefits. However, when consumers engage in the design of their own products, they often do not want to optimize just the core functional features of these products or services. Instead, there is ample evidence that consumers seek to be involved in the creation and display of the symbolic meanings of the brands and products that they use (Ritson and Elliott, 1999), and that these symbolic meanings are critical components of the identity projects that are on-going in most consumers’ lives (Arnould and Thompson, 2005). We believe that due to its unique aspects, aesthetic MC is especially valuable for supporting consumers’ identity projects. First, aesthetic preferences are found to be much more heterogeneous than functional ones, which are more uniformed
within segments of consumers (Holbrook, 1986; Yamamoto and Lambert, 1994). A striking example of the way in which companies feed these preferences is the availability of thousands of different watches on the market that differ in their appearance, but hardly in their functionality. Holbrook demonstrated that consumers’ high variance in aesthetic demands cannot be explained by random differences or noise, but is the result of individual differences between consumers. Aesthetic MC provides a means to address these unique aesthetic preferences. Due to the connection to individual differences, a mass-customized product that closely fits unique aesthetic preferences may help consumers to build an identity that is markedly different from others and thus to support their identity projects. Second, aesthetic MC is subjective and generally visible to others. As a result, we believe that an aesthetically mass-customized product will thus result in an enhanced expression of one’s sense of self and identity (Belk, 1988). This is consistent with previous research, which has shown that consumers may use products, of which they have partly created or modified the appearance, to communicate their individuality, and that such products are perceived as more self-expressive of one’s identity (Blom and Monk, 2003; Kiesler and Kiesler, 2005; Mugge, Schoormans, and Schifferstein, 2009).

The degree to which mass-customized products offer self-expressive value depends on the breadth and depth of choices that is offered by the aesthetic MC configurator. Dellaert and Stremersch (2005) defined the solution space that is offered in a MC configurator as the extent of MC. In some MC configurators, the extent of MC is narrow and shallow because consumers are only offered a small number of choices (e.g., customization of one part of a shoe with only a few colour choices), whereas in other situations they may be offered a wider number of aspects that they can customize (e.g., selecting the colour for each part of a shoe) and/or by being
able to make selections amongst a deeper assortment of choices (e.g., 100 colour choices for one or several parts). An even greater extent of MC is provided if consumers can personally design actual parts of the product (as opposed to just choosing amongst pre-set design alternatives; Franke and Piller, 2003). Greater breadth and depth of MC choices will account for more variations in preferences and thus increase the likelihood that consumers are able to create products that closely fit their individual needs and preferences (Dellaert and Streimersch, 2005; Franke and Piller, 2003; Schreier, 2006).

Based on the preceding discussion, we propose the following hypothesis:

HI: The extent of aesthetic MC positively impacts the self-expressive value of mass-customized products.

2. Perceived Complexity

Despite the clear value that is offered, aesthetic MC may also have a negative effect on consumer responses. Human cognitive capacity to process information is limited and choices amongst large sets of alternatives are typically more effortful and can become potentially overwhelming (Bettman, Johnson, and Payne, 1990). Accordingly, as the number of aesthetic MC choices increases, the degree of complexity associated with the MC task increases as well (Dellaert and Streimersch, 2005; Huffman and Kahn, 1998). This may lead to a sense of confusion and, as a result, consumers may feel insecure about their own ability to choose the right alternative. Also, we anticipate that these negative consequences can be even greater if consumers are offered the possibility to actually create the visual appearance of their product themselves, as opposed to just choosing
amongst a set of pre-set alternatives.

Based on the former arguments, we hypothesize:

\[ H2: \text{The extent of aesthetic MC positively impacts the perceived complexity of the MC task.} \]

III. THE EFFECT OF VISIBILITY OF THE MASS-CUSTOMIZED PRODUCT ELEMENTS TO OTHERS

As discussed, the extent of aesthetic MC is believed to affect the product’s self-expressive value. One intended target for products’ symbolic role of self-expression can be the consumers themselves. Yet, it has been argued that people derive their identity partly from social interactions with others than from internal, psychological forces (Klein, Klein, and Kernan, 1993). It has long been documented that a product’s symbolic communication is often aimed at an external audience and that intended audiences make identity-related inferences about people based on their possessions (Burroughs, 1991; Gosling, Mannarelli, and Morris, 2002). Hence, it is likely that the self-expressive value of a product increases when the product is more visible to others and publicly used and displayed (Bearden and Etzel, 1982).

With respect to MC of product aesthetics, we therefore propose that the benefit of self-expressiveness is enhanced, the more the mass-customized product elements are visible to others. Accordingly, we hypothesize:
**H3:** Visibility of the aesthetically mass-customized product elements to others has a positive effect on the mass-customized product’s self-expressive value.

**IV. EVALUATION AND BEHAVIOURAL INTENTIONS TOWARDS AESTHETIC MC**

Past research has concluded that the functional value that is offered to consumers through a greater extent of functional MC positively affects the intention to purchase the mass-customized product (Dellaert and Stremersch, 2005). Similarly, we anticipate that perceptions of a product’s self-expressive value will mediate the effect of the extent of aesthetic MC on consumers’ evaluation of and behavioural intentions towards MC. In other words, as consumers perceive that the aesthetic MC configurator allows them to create products with greater self-expressive value they will report a more positive evaluation and greater behavioural intentions towards considering such mass-customized products.

Whereas greater extents of aesthetic MC may increase the self-expressive value of the products and thus lead to more favourable MC evaluations, we also expect a countervailing effect. As the extent of aesthetic MC increases, perceptions of MC complexity will also increase and we expect that this will negatively influence overall evaluation and consumers’ behavioural intentions towards aesthetic MC.

Accordingly, we hypothesize:
H4: The mass–customized self–expressive value has a positive effect on the evaluation of MC.

H5: The perceived complexity of the MC task has a negative effect on the evaluation of MC.

H6: Consumers’ evaluation of MC has a positive effect on consumers’ behavioural intentions.

All hypotheses are summarized in a conceptual path model (see Figure 1).

V. METHOD

To test our hypotheses (see Figure 1), a study was conducted with members of a consumer panel. Respondents were presented with one aesthetic MC configurator for a cordless telephone. Six different scenarios were generated. Each scenario described an aesthetic MC configurator that allowed consumers to create different aesthetic variations for the
telephone. After considering the particular MC configurator that was presented to them, the respondents evaluated both the MC configurator and the mass-customized product that could be created with it.

1. Respondents

For the study, 360 respondents were selected from a consumer panel. Two hundred and eighteen respondents (47% males and 53% females; mean age = 42) returned their questionnaire, a response rate of 61%. Respondents received a small financial compensation for their participation.

2. Stimuli

To manipulate the extent of aesthetic MC (three levels of choice) and of the mass-customized product elements to others (two levels), we generated six different versions of an aesthetic MC configurator for a cordless telephone (see Appendix A). A cordless telephone was selected as the stimulus product because it is gender-neutral, affordable, has a high penetration degree, and is relevant for the members of the consumer panel. Also, this is a product, which would typically be visible to the visitors in one’s home or office. It has been shown that around the world, products such as cordless phones are often used in social circles and are on public-display, and that their rapid marketplace acceptance is driven by their symbolic social qualities (Chandrasekaran and Tellis, 2008). Yet, cordless phones also offer the possibility for the aesthetic MC of very visible and less visible aspects of the product.
Two scenarios were generated for the visibility of the mass-customized product elements to others. In the first scenario, the configurator allowed consumers to customize an aspect of the telephone that would be visible to others: the appearance of the actual body (the plastic shell) of the phone. In the second scenario, the configurator allowed the consumers to customize the appearance of the digital display that one sees when dialling, an element that would mostly be seen only by the owner and user of the phone, and would thus be less visible to others.

In addition, three scenarios were generated to manipulate the extent of aesthetic MC. In the low extent of aesthetic MC, the display (or shell) of the cordless telephone could be customized by choosing among four colours. A medium extent of aesthetic MC offered respondents a choice among 99 colours and 24 patterns. Finally, in the high extent of aesthetic MC, respondents had the opportunity to personally create the motif for the display or shell of the telephone.

Each condition was explained in text, with swatches for colours and patterns, and with product pictures. Except for the manipulated elements, the text and layout of the MC configurator was kept constant across conditions. Furthermore, we avoided the use of jargon (e.g., mass customization) to enhance respondents’ comprehension of the MC configurator. The following text was presented for the MC of the shell with a medium extent of aesthetic MC: “The manufacturer offers you the possibility to adapt the cordless telephone’s shell according to your own taste. For adapting the cordless telephone’s shell you can choose a combination of a colour and a pattern. You can choose from the set of 99 colours and 24 patterns that are displayed below”. Across all conditions, a small number of examples of the mass-customized cordless telephone were presented in colour photo-quality pictures to provide respondents with visual representations of how the mass-customized phones may look like based on the choices
offered in the condition assigned to the respondent. The latter corresponds to market practice.

3. Procedure and Measures

Each respondent was sent an email with an invitation to participate in our study. A hyperlink directed respondents to their specific version of the questionnaire. Each respondent was randomly assigned to one of the conditions. An introduction page explained the MC process to the respondents. Next, responses to a series of measures were obtained.

Extent of aesthetic MC was measured using four items on a seven-point Likert scale (1 = “totally disagree”, 7 = “totally agree”). Self-expressive value was measured using three items adapted from Mugge et al., (2009). Consumers’ evaluation of MC was measured with three seven-point semantic differential scales (Alpert and Kamins, 1995). We measured the perceived complexity of the MC task using two seven-point semantic differential scales. Visibility of the mass-customized product elements to others was measured using five items on a seven-point Likert scale. We included three items to measure consumers’ behavioural intentions toward the mass-customized product. All items are presented in Appendix B. Finally, one seven-point semantic differential scale was included to check respondents’ understanding of the presented possibility to customize the cordless telephone (1 = “I did not understand it at all”, 7 = “I understood it completely”).
VI. RESULTS

1. Unidimensionality, Reliability, and Validity

For each scale, the unidimensionality, reliability, convergent validity, and discriminant validity was assessed. The unidimensionality of each scale was explored with principal axis factoring using an eigenvalue of 1.0. All scales passed that test. The reliability of each scale was explored by computing the reliability coefficient. Additionally, the internal consistency and convergent validity of the scales was investigated by performing a confirmatory factor analysis (CFA) on all items of the latent variables using ML-estimation in LISREL 8.72 (Jöreskog and Sörbom, 1993). The results indicated a good fit to the data ($\chi^2 = 262.48$, $df = 155$, $\chi^2/df = 1.69$, GFI = 0.89, CFI = 0.98, NFI = 0.95, RMSEA = 0.057). Although the chi-square was significant, it was smaller than the rule of two times the degrees of freedom as suggested by Bollen (1989). Both the CFI and the NFI satisfied the minimum requirements of 0.90 (Bollen, 1989). Moreover, the RMSEA was below the value of 0.08 (Browne and Cudeck, 1993). Convergent validity was indicated by the fact that the items loaded significantly on their corresponding latent construct (all t’s > 2.0) (Bagozzi, Yi, and Phillips, 1991). Discriminant validity among the scales was assessed in two steps. First, a baseline model (in which the correlations between pairs of constructs were freely estimated) was estimated for each possible pair of scales. Next, we compared this baseline model to a series of alternative models, in which the correlations between pairs of constructs were constrained to unity (Anderson and Gerbing, 1988). In each case, the constrained model exhibited a statistically increase in chi-square, providing evidence of discriminant validity (Bagozzi and Phillips, 1982). Table 1 pre-
Table 1. MEASUREMENT MODEL FIT AND SUMMARY STATISTICS

<table>
<thead>
<tr>
<th>Construct</th>
<th># Items</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach’s α</th>
<th>Eigen-value</th>
<th>Lowest t-value</th>
<th>AVE</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of Aesthetic MC</td>
<td>4</td>
<td>3.82</td>
<td>1.58</td>
<td>0.88</td>
<td>2.945</td>
<td>12.16</td>
<td>0.66</td>
<td>0.89</td>
</tr>
<tr>
<td>Visibility of Mass–customized</td>
<td>5</td>
<td>3.84</td>
<td>1.49</td>
<td>0.89</td>
<td>3.526</td>
<td>9.69</td>
<td>0.64</td>
<td>0.90</td>
</tr>
<tr>
<td>Product Elements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product’s Self–expressive Value</td>
<td>3</td>
<td>3.40</td>
<td>1.64</td>
<td>0.93</td>
<td>2.611</td>
<td>15.07</td>
<td>0.81</td>
<td>0.93</td>
</tr>
<tr>
<td>Perceived Complexity of MC Task</td>
<td>2</td>
<td>2.90</td>
<td>1.40</td>
<td>0.55</td>
<td>1.381</td>
<td>5.09</td>
<td>0.43</td>
<td>0.59</td>
</tr>
<tr>
<td>Evaluation of MC</td>
<td>3</td>
<td>4.80</td>
<td>1.27</td>
<td>0.84</td>
<td>2.291</td>
<td>11.83</td>
<td>0.63</td>
<td>0.84</td>
</tr>
<tr>
<td>Behavioural Intentions</td>
<td>3</td>
<td>4.25</td>
<td>1.61</td>
<td>0.88</td>
<td>2.467</td>
<td>13.27</td>
<td>0.74</td>
<td>0.90</td>
</tr>
</tbody>
</table>

*AVE = Average Variance Extracted; **CR = Composite Reliability

Table 2. INTERCONSTRUCT CORRELATIONS

<table>
<thead>
<tr>
<th>Construct</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Extent of Aesthetic MC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Visibility of Mass–Customized</td>
<td>0.31*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Elements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Product’s Self–expressive Value</td>
<td>0.26*</td>
<td>0.29*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceived Complexity of MC Task</td>
<td>0.08</td>
<td>-0.14*</td>
<td>-0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Evaluation of MC</td>
<td>0.36*</td>
<td>0.23*</td>
<td>0.45*</td>
<td>-0.22*</td>
<td></td>
</tr>
<tr>
<td>6. Behavioural Intentions</td>
<td>0.25*</td>
<td>0.25*</td>
<td>0.60*</td>
<td><em>0.17</em></td>
<td>0.66*</td>
</tr>
</tbody>
</table>

*p < .01
sents the means, standard deviations, and an assessment of unidimensionality, reliability, and convergent validity for the measurement models. Table 2 presents the interconstruct correlations. Together, these results indicated a sufficient degree of unidimensionality, reliability, and validity of the scales.

2. Manipulation and Confounding Check

Two analyses of variance showed that the manipulations of the extent of aesthetic MC and the visibility of the mass-customized product elements to others were successful. Increasing the number of options resulted in significant differences in the extent of aesthetic MC ($F(2, 212) = 13.31, p < 0.001$; $M_{\text{low}} = 3.10$, $M_{\text{medium}} = 4.15$, $M_{\text{high}} = 4.26$). Furthermore, MC of either the shell or display resulted in variations in the visibility of the mass-customized product elements to others ($F(1, 212) = 40.05, p < 0.001$; $M_{\text{display}} = 3.34$, $M_{\text{shell}} = 4.49$). No other effects were found. Because each treatment manipulation only affected the measurement scale intended to measure this manipulation, the discriminant and convergent validity of our manipulations is supported.

Furthermore, the results revealed that the respondents had understood the possibility to mass customize the product ($M = 6.35$, $SD = 1.03$). Ninety-seven percent of the respondents had a score on the scale to measure respondents' understanding that was equal or higher than the midpoint of the scale. No differences were found between the six conditions ($p > 0.05$).
3. Test of the Hypotheses

In order to test our hypotheses, we estimated the structural equation model with latent variables in LISREL 8.72. We used structural equation modelling because this analysis offers the advantage of being able to test all the hypothesized relationships between the different variables simultaneously in one comprehensive model. The modification indices and the standardized residuals were considered to improve the fit of the model. As a result, a direct effect of extent of aesthetic MC on the evaluation of MC and a direct effect of the product’s self-expressive value on the behavioural intentions were added to the initial model (we did not have hypotheses on these links, but they are nonetheless consistent with our theoretical considerations). The estimated model is presented in [Figure 2]. The fit statistics for this model indicated a good fit ($\chi^2 = 278.81$, df = 161, $\chi^2$/df = 1.73, GFI = 0.89, CFI = 0.97, NFI = 0.94, RMSEA = 0.058). As shown in Figure 2, the model explains 46% of the variance in consumers’ evaluation and 64% of the variance in behavioural intentions. The results showed that the extent of aesthetic MC has a positive effect on the product’s self-expressive value (b = 0.17, p < 0.05) and on the evaluation of MC (b = 0.33, p < 0.05), supporting H1. In support of H3, the product’s self-expressive value was also affected by the visibility of the mass-customized product elements to others (b = .26, p < .05). Evaluation of MC was positively affected by the product’s self-expressive value (b = 0.43, p < 0.05). Furthermore, the product’s self-expressive value and the evaluation of MC positively affected behavioural intentions (b = 0.36, p < 0.05 and b = 0.56, p < 0.05, respectively). Hence, H4 and H6 were supported by the data. As the perceived complexity of the MC task was not significantly affected by the extent of aesthetic MC (b = 0.12, p > 0.05), we did not find support for H2. Finally, in accordance to H5, perceived complexity nega-
tively affected the evaluation of MC ($b = -0.36, p < 0.05$).

![Diagram of structural equation model]

* $p < 0.05$

**Figure 2. RESULTS OF THE STRUCTURAL EQUATION MODEL**

No support was found for the effect of extent of aesthetic MC on the perceived complexity of the MC task. Although this corresponds to the results of Dellaert and Stremersch (2005), we wanted to further explore this finding. Further exploration of our data showed that the lack of a linear effect was caused by aberrant results in one of the six conditions: customizing the phone’s display by choosing from 99 colours and 24 patterns (medium extent of MC). Respondents indicated that this was the most complex MC scenario ($M_{shell-low} = 2.49$, $M_{display-low} = 2.53$, $M_{shell-medium} = 2.79$, $M_{display-medium} = 3.59$, $M_{shell-high} = 3.00$, $M_{display-high} = 3.07$). Upon additional consideration of the stimulus presented and the responses to an open-ended question in which respondents were asked to explain their evaluation, we concluded that in this scenario, respondents had found it difficult to determine which combinations of patterns and colours could potentially negatively affect the display’s readability, and thus had found it to be much more complex than expected.
Accordingly, we re-estimated the model for the remaining five scenarios (sample size = 180; \( \chi^2 = 289.07, \text{df} = 162, \chi^2/\text{df} = 1.78, \text{GFI} = 0.86, \text{CFI} = 0.97, \text{NFI} = 0.93, \text{RMSEA} = 0.066 \)). The re-estimated model provided evidence for the effect of extent of aesthetic MC on perceived complexity (\( b = 0.28, p < 0.05 \)), now supporting H2 and importantly also replicating all of the other effects (see Figure 2).\(^1\)

To estimate the net effect of the extent of aesthetic MC on consumers’ evaluation of MC, we assessed the standardized total effect of extent of aesthetic MC on the evaluation of MC as this is calculated by LISREL. The results revealed a significant, positive effect (\( b = 0.37, p < 0.05 \)). This suggests that the positive impact of aesthetic MC due to the product’s self-expressive value is stronger than the negative impact due to the perceived complexity of the MC task.

**VII. GENERAL DISCUSSION**

Several scholars have acknowledged a void in studying MC from a consumers’ perspective (Dellaert and Stremersch, 2005; Franke and Piller, 2004; Kaplan and Haenlein, 2006). Although there is a growing body of research regarding MC in general, we lack a clear understanding of con-

\(^1\) To provide additional support for our model, we also checked for possible interaction effects between the variable extent of aesthetic MC and visibility of the mass-customized product elements on the product’s self-expressive value and the perceived complexity of the MC task. None of these interactions proved to be significant (p’s > .10).
sumer response to the MC of product aesthetics. The present research fills some of this identified void in the literature by investigating the factors that explain consumer responses to aesthetic MC. Understanding the factors that affect consumers’ evaluations of aesthetic MC can help firms to more successfully implement aesthetic MC strategies in new products.

Our findings support our conceptual model, and underscore the importance of the identity construct with respect to the MC of product aesthetics. Specifically, we conclude that increasing the extent of aesthetic MC positively affects the product’s self-expressive value, which in turn positively affects consumers’ intention to purchase the product. This supports the argument that aesthetic MC differs from functional MC. Aesthetic MC is different from a psychological perspective, because it provides symbolic value through the product’s ability for self-expression. In contrast, functional MC can result in products that better fit individual utilitarian preferences, but do not provide such a self-expressive value. As a result, different antecedents may drive the two types of MC, which is supported by the effect of the visibility on the evaluation of aesthetic MC.

In addition to the hypothesized relationships, two other relationships were found. Because both relationships are mainly the result of partial (as opposed to full) mediation processes, these relationships do not represent significant departure from our theoretical model. First, the results suggested that the mass-customized product’s self-expressive value serves as a partial mediator for the effect of the extent of aesthetic MC on consumers’ evaluation of MC. Past research concluded that besides the better fit to one’s preferences, consumers may also appreciate MC because it results in a unique product and because it allows them to have an exciting and enjoyable experience (Fiore, Lee, and Kunz, 2004; Franke and Piller, 2004; Schreier, 2006). It is likely that aesthetic MC can offer these benefits of MC to consumers as well. In line with these arguments, Kamali and
Loker (2002) found that consumers are more satisfied with a MC website if they are offered more freedom in the ‘design’ process. Second, the degree to which the mass-customized product expresses the consumer’s identity positively affected the behavioural intentions toward the mass-customized product directly, suggesting that the evaluation of MC serves as a partial mediator. In our study, the MC task entailed the adaptation of the colour and pattern of the cordless telephones’ shell or display, but not of its overall shape. Nevertheless, the overall shape may significantly determine the degree to which a product expresses one’s identity. It is likely that consumers take into account the self-expressiveness of the product in total in their behavioural intentions toward the mass-customized cordless telephone. Consequently, the product’s self-expressive value positively affects the intentions to consider or purchase the cordless telephone, independent from the degree to which consumers evaluate the MC itself positively.

1. Managerial Implications

For many years, both scholars and practitioners have had high expectations concerning MC (e.g., Pine II, 1993). Nevertheless, nowadays, mass-customized products still take up only a small percentage of the total market of consumer durables. There are several reasons why only a relatively small number of companies have implemented MC in products so far. From a technical perspective, the implementation of MC is generally complex and costly. Moreover, consumers may not always be interested in mass-customized products, which may have contributed to the current small market share as well. To successfully implement MC in products, managers need to understand and know how to optimize consumer
responses to MC. Only when consumers believe that the relative value of a mass-customized product outweighs that of an off-the-shelf, mass-produced product, they are willing to purchase the mass-customized product. Firms should thus aim to increase the relative value of a mass-customized product in comparison to off-the-shelf, mass-produced products by implementing the MC process in such a way that either the perceived benefits of MC are enhanced and/or the drawbacks of MC are avoided. The present article contributes to the understanding of the perceived benefits and drawbacks of aesthetic MC and, therefore, provides several implications for firms interested in pursuing aesthetic MC strategies. First, we demonstrate that consumers value the MC of product aesthetics because it provides symbolic benefits through the product’s ability for self-expression. As a result of these different benefits, the particular product category will affect how much value aesthetic MC can offer to consumers. Specifically, our findings suggest that implementing aesthetic MC is especially worthwhile for product categories that consumers use to communicate their identity. For example, it is thus more valuable to aesthetically mass customize a watch than an alarm clock, whereas this may not be true for functional MC. In this respect, managers should also determine which product categories are used by their specific target group to communicate their identity. For example, some consumers may own a mobile phone merely for its utilitarian function, whereas others may view this product as a significant symbol of their self. Obviously, aesthetic MC is a much more viable strategy for the latter group of consumers. Furthermore, to take advantage of the market potential of MC, managers need to understand under which conditions consumers evaluate aesthetic MC more positively. In this respect, our findings suggest that whether the mass-customized product elements are visible to others affects consumer response to aesthetic MC. It is in these situations where the mass-cus-
tomized product is used in public and the aesthetically mass-customized elements are visible to many others, that aesthetic MC can offer greater self-expressive value and bring more positive consumer responses. Conversely, consumers may be reluctant to invest their time and effort in the aesthetic MC process if the product is only privately consumed and not visible to others, and may then prefer an off-the-shelf product instead. Striving to enhance the product's self-expressive value through aesthetic MC is especially important considering the negative effect of the perceived complexity of the MC task on consumers' evaluation of MC. Only if MC provides consumers with enough value to counterbalance the perceived complexity, it will be a success. Finally, in order to optimize consumer response to aesthetic MC, firms could also consider the specific design of the MC configurator and in which ways this configurator can help to reduce the perceived complexity of the MC task.

2. Limitation and Directions for Future Research

The present research used hypothetical MC configurators rather than actual purchase situations to measure consumer response towards aesthetic MC, which can be considered a limitation. However, this research design allowed us to create systematic variations in the extent of aesthetic MC, while controlling for other influencing effects. Moreover, the usage of simulated configurators corresponds to previous research on MC (e.g., Franke et al., 2009). Nevertheless, future research should investigate actual customers of an aesthetic MC website to replicate our findings.

The present research was limited to the aesthetic MC of only one part of the product, and therefore, the breadth of aesthetic options was narrow in
all scenarios. Some companies offer the possibility to aesthetically customize various parts of a product (e.g., various parts of a pair of Nike shoes). We expect that increasing the extent of aesthetic MC through offering a greater breadth of options is comparable to that through offering a greater depth. Accordingly, both are likely to improve a person’s ability to create a product that fits their identity.

Furthermore, our research investigated the perceived self-expressive value of the product. It remains questionable whether a mass-customized product will truly result in a greater fit to one’s identity or whether the perceived fit is triggered by a person’s biased perception of this product. Because consumers are the active creators of the mass-customized product, it may elicit feelings of accomplishment (Franke et al., 2010). As a result, people may simply perceive the product as providing a better fit to their identity (Simonson, 2005). More research is necessary to investigate the role of consumers’ active participation on their evaluation of the mass-customized product.

Another limitation of the present research is that we only included different versions of aesthetic MC configurators as stimuli. Although this approach enabled us to gain interesting insights in consumer response to aesthetic MC and how this differs from functional MC, it would be valuable to validate these findings in an empirical study that includes both functional and aesthetic MC configurators as stimuli. Furthermore, it is likely that consumers’ evaluation of aesthetic and functional MC will depend on the goal that consumers want to fulfil with the purchase. For example, when purchasing a laptop bag, some consumers may want to fulfil aesthetic goals because they want to look good when carrying the bag. In contrast, others may want to purchase a laptop bag to fulfil primarily functional goals (e.g., easy carrying, useful pockets). We recommend that
future research assess how different consumption goals or contexts influence the desired extents of aesthetic and functional MC.

To successfully implement aesthetic MC, manufacturers need to understand under which conditions consumers evaluate aesthetic MC more positively. Our results suggest that consumers like to mass customize product aesthetics, because these individualized products can express their identity. To stimulate this benefit, firms should implement MC configurators with a great extent of aesthetic MC that result in highly visible outcomes, while reducing the perceived complexity of the MC task.
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## APPENDIX A: Scenarios

### Three Levels of Shell Customization

<table>
<thead>
<tr>
<th>Extent of Customization</th>
<th>Examples Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low extent</strong>: One of 4 colours</td>
<td><img src="image1.png" alt="Examples" /></td>
</tr>
<tr>
<td><strong>Medium extent</strong>: 24 patterns* 99 colours</td>
<td><img src="image2.png" alt="Examples" /></td>
</tr>
<tr>
<td><strong>High extent</strong>: Infinite possibilities</td>
<td><img src="image3.png" alt="Examples" /></td>
</tr>
</tbody>
</table>

*Use whatever image you prefer*

### Three Levels of Display Customization

<table>
<thead>
<tr>
<th>Extent of Customization</th>
<th>Examples Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low extent</strong>: One of 4 colours</td>
<td><img src="image4.png" alt="Examples" /></td>
</tr>
<tr>
<td><strong>Medium extent</strong>: 24 patterns* 99 colours</td>
<td><img src="image5.png" alt="Examples" /></td>
</tr>
<tr>
<td><strong>High extent</strong>: Infinite possibilities</td>
<td><img src="image6.png" alt="Examples" /></td>
</tr>
</tbody>
</table>

*Use whatever image you prefer*
APPENDIX B: Measures

Extent of Aesthetic MC
1. The possibility to adapt the display/shell of the cordless telephone to my own taste is large
2. I have much influence on the appearance of the display/shell of the cordless telephone
3. I am contributing to a high degree in designing the display/shell of the cordless telephone
4. I have a lot of freedom to adapt the display/shell of the cordless telephone

Visibility of Mass–Customized Product Elements
1. Adaptations made on the display/shell of the cordless telephone are clearly visible to others
2. The adapted display/shell of the cordless telephone can easily be judged by others
3. The adapted display/shell of the cordless telephone will strike a lot of people
4. The adapted display/shell of the cordless telephone will only be seen by the user of the product
5. The adapted cordless telephone will be noticed quickly by others

Product’s Self–Expressive Value
1. The adapted cordless telephone will better correspond to my identity than a general cordless telephone
2. The adapted cordless telephone will better fit me than a general cordless telephone
3. The adapted cordless telephone better expresses who I am than a gen–
eral cordless telephone

Perceived Complexity of MC Task
I think the possibility to adapt the cordless telephone is:
1. easy/complex
2. not risky/risky
Evaluation of MC

How would you judge the possibility to adapt the cordless telephone?
1. dislike/like
2. unfavorable/favorable
3. negative/positive

Behavioural Intentions
1. I would certainly consider the possibility to adapt the cordless telephone
2. I would certainly buy a cordless telephone with the possibility to adapt it
3. I would certainly seek more information about the possibility to adapt the cordless telephone

* Reverse coded item
Consumer Response to Aesthetic Mass Customization

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국문초록: 최근 대량 맞춤생산(Mass Customization, MC)에 대한 소비자와의 일반적인 반응에 대해 연구하고 있는데 비해 이 논문은 특히 심미적인 부분과 기능적인 부분의 MC에 대한 소비자의 반응을 분석하고자 한다. 이를 통해 기업은 심미적인 MC를 성공적으로 실행할 수 있을 것이다. 아름다음을 추구하는 MC를 구성하는 다양한 요소들이 제시되었다. 우리는 제품의 심미성이, 즉 아름다움을 강화하는 방향으로 맞춤생산을 하게 되면 '자기표현적 가치'를 강화하며, 이는 소비자의 평가를 긍정적으로 만든다. 소비자의 긍정적인 평가는 대가 제품을 사고 싶다는 '구매욕구'로 연결된다. 뿐만 아니라 더 큰 심미적 MC는 과업의 복잡성을 더 크게 인식하도록 만들어서 평가에 부정적인 영향을 미친다. 결론적으로 눈에 띄게 두드리는 MC 제품은 미적으로 맞춤화된 제품의 자기표현력 가치를 높인다는 것이다.

주 제 어: 대량 맞춤생산, 제품디자인, 심미면, 자기정체성

***교신저자