Towards an understanding of how the capabilities deployed by a Web-based sales configurator can increase the benefits of possessing a mass-customized product

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Abstract. Manufacturers that adopt mass customization are paying a growing attention to understanding not only how product customization can be delivered efficiently, but also how this strategy can create value for their customers. As reported in literature, the customer-perceived value of a mass-customized product also depends on the uniqueness and self-expressiveness benefits that a customer may experience above and beyond the traditionally considered utility of possessing a product that fits with the customer's functional and aesthetical needs. Increasing customer-perceived value by delivering uniqueness and self-expressiveness benefits can therefore be one key in augmenting the customer's willingness to pay for a mass-customized product. This paper conceptually develops and empirically tests the hypotheses that five sales-configurator capabilities previously defined in literature increase uniqueness and self-expressiveness benefits of a mass-customized product, in addition to the traditionally considered utilitarian benefit. The hypothesized relationships have been tested by analyzing self-customization experiences made by engineering students using a set of real Web-based sales configurators of different consumer goods. The analysis results show that easy comparison, flexible navigation and focused navigation capabilities have a positive impact on each of the considered benefits, while user-friendly product space description and benefit-cost communication capabilities have a positive impact on utilitarian benefit only. The findings of this study complement previous research results on what characteristics sales configurators should have to increase consumer-perceived benefits of mass customization.

1 Introduction

According to Pine [42, p.48] mass customization is defined as ''developing, producing, marketing and delivering affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want''. Nowadays, mass-customization strategies are more and more widespread and, therefore, mass customizers may need to identify unexploited sources of differentiation advantage [35].

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In such a context, increasing the customer-perceived benefits of possessing a mass-customized product can be one key in delivering value that exceeds those of competing mass customizers' offerings. In particular, manufacturers that adopt mass customization need to take into account the various benefits that consumers can experience from mass-customization and the product value implication for customers [51]. While early literature emphasized the utilitarian benefit of possessing a product that better fit with one's idiosyncratic functional and aesthetical needs, the recent literature has developed more sophisticated knowledge of the value implications of mass customization to individual customers [20]. In particular, it has recently been acknowledged that providing other benefits in addition to the utilitarian one is crucial in augmenting customers' willingness to pay.

Since mass customizers are increasingly adopting Web-based sales configurators, it is important to understand what characteristics sales configurators should have to increase customer-perceived benefits of a mass-customized product. Previous research, however, has focused on how sales configurators should be designed to increase the traditionally considered utilitarian benefit of owning a self-customized product. The present paper offers additional insights into this issue by conceptually developing and empirically testing hypotheses on how capabilities deployed by a Web-based sales configurator can increase the benefits of possessing a mass-customized product.

2 Background

2.1 Consumer perceived benefits of a mass-customized product

According to Holbrook [33], every consumption experience involves an interaction between a subject and an object, where the subject of interest is a consumer or customer and the object of interest is some product or service. The value that the consumer gains from the consumption experience is created through that interaction [19]. Mass customization allows customers to ask for new personalized products at a level of individualized tailoring that was never possible before [1]. Addis and Holbrook [1] identified a trend that the same authors called 'an explosion of subjectivity' [1, p.2] to denote the emerging phenomenon of a more widespread role that individual subjectivity plays in consumption, where the term 'subjectivity' refers to a personal psychological state - that is, one's

own way of feeling, thinking, or perceiving. According to these authors, mass customization implicitly recognizes the growing importance of consumer subjectivity.

Previous mass-customization studies on mass-customized product value [26, 38, 26, 47] explain that, in addition to the well-researched utilitarian benefit, there are two benefits, namely uniqueness and self-expressiveness benefits, which a consumer could derive from the possession of a mass-customized product.

Utilitarian benefit, according to Merle et al. [38], is a benefit deriving from the closeness of fit between product objective characteristics (i.e. aesthetical and functional characteristics) and an individual's preferences. In other terms, utilitarian benefit derives from the fact that the self-customized product fulfills the individual's idiosyncratic functional and aesthetical needs [1].

The uniqueness benefit of possessing a mass-customized product is defined by Merle et al [38] as the benefit that a consumer derives from the opportunity to assert his/her personal uniqueness by using a customized product. Uniqueness benefit is related to the symbolic meanings a person attributes to the objects as a result of social construction [12, 52, 49, 53, 29, 39]. Brewer's [8] optimal distinctiveness theory posits that people have opposing motives to fit in and stand out from social groups. A series of studies by Brewer and colleagues e.g. [9] has shown that, whereas threats to one's inclusionary status produce increased attempts to fit in and conform, threats to one's individuality produce attempts to demonstrate how different one is from the rest of the group. Consequently, uniqueness benefit deriving from a mass-customized product will meet the individual need to assert his/her own personality by differentiating his/her self from others [21, 50].

Self-expressiveness benefit is defined by Merle et al. 38] as the benefit that originates from the opportunity to possess a product that is a reflection of the consumer's image. This is in accordance with the self-consistency motive underlying self-concept, where the term "self-consistency" denotes the tendency for an individual to behave consistently with his/her view of his/her self [48]. Like uniqueness, self-expressiveness benefit is related to the symbolic meanings a person attributes to the objects as a result of social construction [12, 52, 49, 53, 29, 39]. According to Belk [4], possessions are often extension of the self. As Belk states, "people seek, express, confirm, and ascertain a sense of being through what they have" [4, p.146]. The above statement implicitly relates identity with consumption. Consumers deliberately acquire things and engage in consumption practices to achieve a pre-conceived notion of their selves [46]. Thus, a mass-customized product will accomplish an individual's need for self-consistency through the possession of a product that is a reflection of his/her self.

2.2 Sales configurators

Consistent with previous research [23, 32, 30], we define sales configurators as knowledge-based software applications that support a potential customer, or a sales-person interacting with the customer, in completely and correctly specifying a product solution within a company's product offer.

The benefits and challenges of implementing and using a sales configurator have been the focus of several researches e.g., [54, 23, 34, 57, 58, 30-31]. Relatively less studies, however, have addressed the question of what characteristics a sales configurator should have to increase such benefits and alleviate such challenges. For example, Randall et al. [43] suggest that, depending on a customer's expertise with a product, a sales configurator should present either product functions and product performance characteristics or design parameters to the potential customer. Another example is Chang et al.'s [13] recommendation that a sales configurator provides potential customers with examples of configured products, in order to offer them guidance about what to do. More recently, Trentin et al. [56] have conceptualized five sales-configurator capabilities based on previous research recommendations. The definitions of such capabilities are reported in Table 1.

Table 1. Sales-configurator capabilities [55]

Capability	Definition
Benefit-cost communication	The ability to effectively communicate the consequences of the configuration choices made by a potential customer both in terms of what he/she would get and in terms of what he/she would give
User-friendly product-space description	The ability to adapt the description of a company's product space to the individual characteristics of a potential customer as well as to the situational characteristics of his/her using of a sales configurator
Easy comparison	The ability to support sales-configurator users in comparing product configurations they have previously created
Flexible navigation	The ability to let sales-configurator users easily and quickly modify a product configuration they have previously created or are currently creating
Focused navigation	The ability to quickly focus a potential customer's search on those solutions of a company's product space that are most relevant to the customer himself/herself

Previous studies on sales configurators, however, have typically regarded the mass-customized product only as a source of utilitarian benefits related to the fulfillment of customers' functional and aesthetical needs. As discussed in the previous section, however, a mass-customized product can also be a source of benefits resulting from uniqueness and self-expressiveness. What characteristics a sales configurator should have to increase uniqueness and self-expressiveness benefits is therefore a question that deserves additional research, as previously pointed out by Schreier [47] or Franke and Schreier [28].

3 Research hypotheses

In addressing the question raised at the end of the previous section, we draw upon the five sales-configurator capabilities conceptualized by Trentin et al.[55, 56] based on prior research on sales configurators. For each of these capabilities, we develop hypotheses about its effects on both uniqueness benefit and self-expressiveness benefit, as well as on the traditionally considered utilitarian benefit of possessing a mass-customized product.

In the existing literature, a number of studies make the point that, to increase the utilitarian benefit of possessing a mass-customized product, a sales configurator should support a company's potential customer in learning about the options available within the company's solution space, in learning about how these options are

useful in fulfilling his/her preferences and in learning about his/her preferences themselves e.g., [62, 43, 44] The more a sales configurator supports such a learning process about one or more of these aspects during the configuration task, the more a potential customer is enabled to create, within a company's product space, the configuration that best fits with his/her objective needs [59, 25]. Prior research has focused on product fit with an individual's functional and aesthetical needs, which leads to the traditionally considered utilitarian benefit. However, this also applies to product fit with an individual's need for asserting his/her own personality by differentiating his/her self from others. Consequently, such a learning process also augments the uniqueness benefit that a customer will enjoy from the possession of the configured product. Finally, this also applies to product fit with an individual's need for behaving consistently with his/her view of his/her self by possessing a product that reflects his/her self concept. Accordingly, such a learning process also increases the self-expressiveness benefit that a customer will derive from the product configuration eventually purchased.

Clearly, the more effective the learning process enabled by a sales configurator, the greater the utilitarian benefit, the uniqueness benefit and the self-expressiveness benefit of possessing the configured product. While Franke and Hader [25, p.16] find that the learning effects of single self-customization experiences lasting only a few minutes with sales configurators "that were not even specifically designed for learning purposes are remarkable", we argue that such learning effects are greater if a sales configurator deploys a higher level of each of the capabilities conceptualized by Trentin et al. [55, 56] based on prior research on sales configurators.

A sales configurator with a higher level of flexible navigation capability allows a potential customer to go through a greater number of complete trial-and-error cycles to evaluate the effects of his/her prior choices and to improve upon them. This is because this kind of sales configurator allows its users to change, at any step of the configuration process, the choice they made at any previous stage without having to begin the process all over again and allows them to immediately recover a previous configuration in case they decide to reject the newly-created one [56]. By conducting more trial-and-error tests, the potential customer learns more about the available choice options and the value he/she would derive from them [59, 60].

A sales configurator with a higher level of user-friendly product space description capability promotes a potential customer's learning process by increasing the congruence between the challenges of the configuration task and the abilities of the configurator user. This is because a sales configurator with this capability presents product space information to potential customers using the most suitable format (e.g., text, image, animation,…) depending on their skill levels and cognitive styles and offers different types of choices (e.g., among product functions and performance levels rather than among product components, or vice versa) according to the users' prior knowledge about the product [56]. In addition, such a sales configurator allows its users to decide for themselves how many feedback details they want to tackle, without forcing them to process information content they do not value [56]. By tailoring the sales configuration experience to each individual user's characteristics on both the content and presentation levels [36], a sales configurator with higher user-friendly product space description reduces the risk that the configuration task is too difficult and, therefore, the user reacts with frustration. At the same time, such a sales configurator alleviates the risk that the configuration task is too easy and, thus, the individual gets bored. In both cases, the effectiveness of the learning process would be undermined [3, 63, 41].

A sales configurator with a higher level of focused navigation capability increases learning effects by tailoring the sales configuration experience to each individual user's characteristics on the interaction level [36]. A sales configurator with this capability enables its users to freely prioritize their choices regarding the various attributes of a product and, therefore, allows them to quickly eliminate options they regard as certainly inappropriate from further consideration [56]. In addition, such a sales configurator enables its users to decide for themselves how many configuration options they want to tackle, as not all potential customers are necessarily interested in, and/or able to fully exploit the potential of customization offered by a company [43]. In this manner, this kind of sales configurator reduces the risk that the configuration task is frustrating as well as the risk that it is boring, and both of these situations would undermine the effectiveness of the learning process [3, 63, 41].

A sales configurator with a higher level of benefit-cost communication capability promotes a potential customer's learning process by providing him/her with better pre-purchase feedback on the effects of his/her configuration choices. Such a sales configurator is more effective in explaining the benefits the customer would derive from consumption of the configured product, as well as the monetary and nonmonetary sacrifices that the customer would bear for obtaining that product [56]. For example, a sales configurator with a higher level of benefit-cost communication capability takes advantage of three-dimensional Web and virtual try-on technologies to more closely simulate customers' real-world interactions with their configured products [18, 14]. As the feedback provided by the sales configurator improves, so does the effectiveness of the potential customer's learning process [10].

Finally, a sales configurator with a higher level of easy comparison capability increases learning effects by providing better pre-purchase feedback on the effects of the configuration choices made by a potential customer. This is because such a sales configurator allows its users to compare previously-saved configurations on the same screen and to rank-order them based on some criterion that is meaningful to the users [56]. Again, the better the feedback provided, the more effective the customer's learning process [10].

As each of the sales configurator capabilities mentioned above make the learning process more effective and the effectiveness of such a learning process increases the utilitarian benefit, the uniqueness benefit and the self-expressiveness benefit of the configured product eventually purchased, we posit the following hypotheses, which are graphically summarized in Figure 1.

HXa. *The higher the level of flexible navigation capability (H1a), focus navigation capability (H2a), benefit-cost communication capability (H3a), user-friendly product space description (H4a), easy comparison capability (H5a) deployed by a sales configurator, the greater the utilitarian benefit that a consumer derives from a product self-customized using that configurator.*

HXb. *The higher the level of flexible navigation capability*

(H1b), focus navigation capability (H2b), benefit-cost communication capability (H3b), user-friendly product space description (H4b), easy comparison capability (H5b) deployed by a sales configurator, the greater the uniqueness benefit that a consumer derives from a product self-customized using that configurator.

***HXc**. The higher the level of flexible navigation capability (H1c), focus navigation capability (H2c), benefit-cost communication capability (H3c), user-friendly product space description (H4c), easy comparison capability (H5c) deployed by a sales configurator, the greater the self-expressiveness benefit that a consumer derives from a product self-customized using that configurator.*

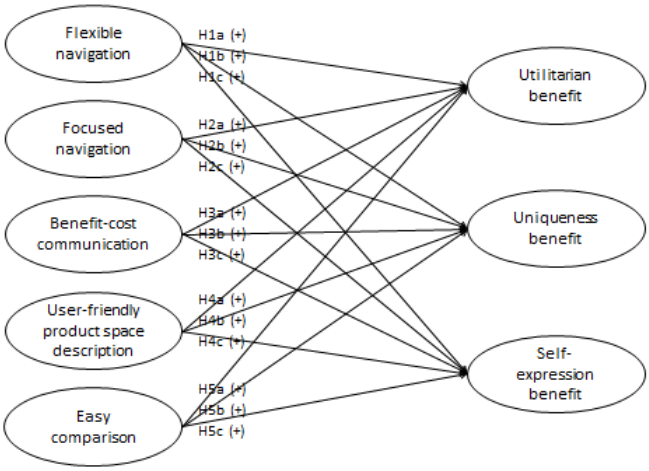

Figure 1. Research hypotheses overview

4 Method

To test our hypotheses we conducted an empirical analysis using data collected from a sample of 675 sales-configuration experiences made by 75 students at the authors' university (age range: 24-27; 30% females). Each participant was asked to make one mass-customization experience on each of nine pre-assigned Web-based sales configurators and, for each experience, to fill out a questionnaire covering the constructs of interest (see Appendix A), for a total of 675 mass-customization experiences. Each experience involved browsing the sales-configuration website and configuring one product from start to finish, on that website, according to one's own preferences. The nine sales configurators assigned to each participant were chosen from a set of 30 real Web- based configurators of consumer goods. The set included ten configurators of notebooks/laptops (e.g., www.dell.com), nine configurators of sports shoes/sneakers (e.g., www.converse.com) and eleven configurators of economy cars (e.g., www.volkswagen.com). The inclusion of multiple product categories, ranging from relatively simple products with relatively few configuration steps to more complex products with more configuration steps, was motivated by the aim of increasing the variation ranges of the independent variables within our sample. To further increase the differences among the mass-customization experiences comprising our sample, we assigned sales configurators to participants according to the following rules: (i) no pairs of participants were assigned the same combination of configurators, (ii) each participant was assigned three configurators for each product category, and (iii) each of the triples assigned to each participant included at least one product configurator with a high mean score of the five capabilities within the corresponding product category and at least one configurator with a low mean score of the five capabilities within the same product category.

The data were analyzed through structural equation modeling, using LISREL 8.80. Following Anderson and Gerbing [2], we decided to adopt a two-step approach, assessing construct validity before the simultaneous estimation of the measurement and structural models. Moreover, since our variables did not meet the assumption of multivariate normal distribution (Mardia's test significant at $p<0.001$), we applied the Satorra-Bentler correction to produce robust maximum likelihood estimates of standard errors and Chi-square. Prior to conducting the analysis, Prior to conducting the analysis, we decided to control for possible effects of participants' characteristics. Consequently, and consistent with prior studies (e.g., [37, 56]), we regressed our observed indicators on 75 dummies representing the participants in our study and used the standardized residuals from this linear, ordinary least square regression model as our data in all the subsequent analyses. Confirmatory factor analysis (CFA) was subsequently employed to assess unidimensionality, convergent validity, discriminant validity, and reliability of our measurement scales. We tested a CFA model specifying the posited relations of the observed variables to the underlying latent constructs, with these constructs allowed to correlate freely [2]. Our CFA model showed good fit indices (RMSEA (90% CI)= 0.0489 (0.0445; 0.0533), GFI=0.927, NFI=0.987), meaning that the hypothesized factor structure reproduced the sample data well. The standardized factor loadings were all in the anticipated direction, greater than 0.50 and statistically significant at $p<0.001$. Altogether, these results suggested unidimensionality (i.e., a set of empirical indicators reflect one, and only one, underlying latent factor) and good convergent validity (i.e., the multiple items used as indicators of a construct significantly converge) of our measurement scales [11, 2]. Discriminant validity, which measures the extent to which the individual items of a construct are unique and do not measure other constructs, was tested using [22] procedure. For each latent construct, the square root of the average variance extracted (AVE) exceeded the correlation with all the other latent variables, thus suggesting that our measurement scales represent distinct latent variables [22]. Reliability of the measurement scales was assessed using both AVE and the Werts, Linn and Joreskog (WLJ) composite reliability (C.R.) method [61]. All the WLJ composite reliability values were greater than 0.70 and all the AVE scores largely exceeded 0.50. This indicates that a large amount of the variance is captured by each latent construct rather than being due to measurement error [22, 40].

5 Results

After establishing measurement scale reliability and validity for the focal constructs, we estimated the full model including the hypothesized relationships among the same constructs. Our hypotheses were that all five sales-configurator capabilities increase consumer-perceived utilitarian benefit, uniqueness benefit and self-expressiveness benefit of a mass-customized product. Accordingly, all five capabilities were modeled as impacting both utilitarian benefit and uniqueness benefit and self-expressiveness benefit. Table 2 reports the LISREL estimates of the path coefficients and the corresponding *t* values. In assessing whether a hypothesis is

supported or not, we adopted a p value of 5% as a threshold. This is a conservative choice, as a cut-off value of 10% is often used in literature.

Table 2. Path coefficients of the estimated model

		BCC	EC	FlexN	FocN	UFD
UT	Coeff.[§]	0,283***	0,102***	*0,132***	*0,379***	*0,146**
	t value[†]	*3,654*	*3,669*	*2,735*	*5,237*	*2,451*
UN	Coeff.[§]	0,004	0,299***	0,304***	0,253*	0,034
	t value[†]	*0,036*	*6,773*	*4,106*	*2,537*	*0,42*
SE	Coeff.[§]	0,148	0,19***	0,151**	0,337***	0,06
	t value[†]	*1,82*	*5,346*	*2,612*	*4,137*	*0,95*

UT = *utilitarian benefit* — *BCC* = *benefit-cost communication*
UN = *uniqueness benefit* — *EC* = *easy comparison*
SE = *self-expressiveness benefit* — *UFD* = *user-friendly product-space description*
FlexN = *flexible navigation*
FocN = *focused navigation*

Significant at: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.
[†]Cut-off *t* value: 10%: 1.645; 5%: 1.960; 1%: 2.576; 0.1%: 3.29.

As regards utilitarian benefit, all the estimated path coefficients were positive, as hypothesized, and statistically significant at $p< 0.05$, indicating that all our hypotheses regarding the utilitarian benefit are supported. As regards uniqueness benefit, the estimated path coefficients were positive, as hypothesized, and statistically significant at $p< 0.05$ for easy comparison, flexible navigation and focused navigation capabilities, but not for benefit-cost communication and user-friendly product space description capabilities. Therefore, only three of our five hypotheses are supported. The same pattern of results was found with regard to self-expressiveness benefit. It is worthwhile noting, however, that the estimated path coefficient between benefit-cost communication capability and self-expressiveness benefit is statistically significant at $p< 0.10$, though not at $p< 0.05$.

6 Conclusions

6.1 Discussion of results and related work

The analysis results support the hypotheses that easy comparison, flexible navigation and focused navigation capabilities raise not only the utilitarian benefit of possessing a mass-customized product, but also its uniqueness and self-expressiveness benefits. These findings improve our understanding of how product configurators should be designed to increase customers' willingness to pay for a mass-customized product by triggering uniqueness and self-expressiveness benefits, in addition to utilitarian benefit.

As regards user-friendly product space description and benefit-cost communication capabilities, however, only the hypotheses that they increase utilitarian benefit are supported, while the others are not. Two possible explanations can be provided for these unexpected findings. One explanation revolves around the notion of functional fixedness. Functional fixedness is the phenomenon in which an individual finds difficulties in attributing and recognizing different types of relationships between objects presented to him/her during decision-making processes or problem-solving situations [15]. Another possible explanation is that the existing sales-configurators, even when they deploy higher levels of benefit-cost communication and user-friendly product space description capabilities, provide feedback information with content and format that are appropriate for promoting potential customers' learning about the possibility to fulfill customers' functional and aesthetical needs through the consumption of a configured product, but are not appropriate for supporting the same learning process as far as satisfaction of uniqueness and self-consistency needs are concerned. However, these are conjectures; further research is needed on this issue.

The present paper contributes to the debate as to what characteristics sales configurators should have to increase consumers' willingness to buy as well as consumers' willingness to pay for a mass-customized product. This debate has typically focused on a twofold objective: (i) alleviating the difficulty that a consumer experiences in self-customizing a product with a sales configurator and in making a purchase decision and (ii) increasing the utilitarian benefit deriving from the closeness of fit between the objective characteristics of the configured product and the consumer's functional and aesthetical needs. Several recommendations have been made by prior, both conceptual and empirical studies joining this debate, and many of these recommendations are subsumed by the five sales-configurator capabilities considered in this study [56]. Higher levels of these capabilities have been found as predicting both higher levels of satisfaction with the configured product and higher levels of purchase intention [56]. More recently, the debate has been enriched by the consideration of the benefits that a consumer can gain from the experience of self-customizing a product using a sales configurator above and beyond those deriving from the possession of the configured product. In particular, Trentin et al. [55] find that the same five sales-configurator capabilities considered in the present study increase hedonic benefit, which stems from the capacity of the experience to be gratifying per se, regardless of the completion of the configuration task, and creative-achievement benefit, which derives from the capacity of the experience to arouse, in combination with the configured product, the positive emotion of pride of authorship. The present study makes an additional contribution to this debate by examining the impacts of the same five sales-configurator capabilities on another two benefits that a consumer can enjoy by purchasing a mass-customized product, in addition to the traditionally considered utilitarian benefit: namely, the benefits of uniqueness and self-expressiveness.

Related work has been conducted in the domain of recommender technologies. Like Web-based sales configurators, recommender applications are intended to support online customers in making purchase decisions [45]. With a focus on knowledge-based recommender applications, Felfernig et al. [16] empirically examine the effects of a number of possible features of such applications on a variety of outcome variables, including a consumer's willingness to buy and his/her trust in that the application recommended the optimal solution. The examined features include the provision of a justification for why a product fits to a certain customer, the possibility of making product comparisons, and the fitting of the interactive user-recommender dialog to the user's product domain knowledge. These features are captured by the capabilities of benefit-cost communication, easy comparison and user-friendly product space description which are considered in the present study. Interestingly, Felfernig et al. [16] find that the recommender versions exhibiting such features are associated with higher ratings of users' trust in the recommended products, which in turn is

positively associated with users' willingness to buy the products. This result is echoed by our findings that benefit-cost communication, easy comparison and user-friendly product space capabilities predict the utilitarian benefit deriving from the possession of a mass-customized product.

6.2 Limitations and further research

The present research is not without limitations, which might be addressed in future research. A primary limitation lies in the fact the empirical study was conducted with engineering students and using only three categories of consumer goods. While engineering students are undeniably potential buyers of the considered products, they constitute a biased sample of the potential customers of such goods. In addition, these products represent only a small subset of consumer goods. A wider set of products would strengthen the generalizability of the results. Consequently, future research should seek to replicate our findings in truly representative samples of potential customers and should use a wider set of consumer goods.

Another limitation of the present study is its focus on the main effects [17] of the five considered sales-configurator capabilities on the three consumer-perceived benefits of interest. In line with this focus, we neglect possible interaction effects between the five capabilities as well as possible contingency effects. Future studies should be designed to overcome this limitation.

6.3 Managerial implications

While having its limitations, our study not only reinforces the importance of the research on the role of sales configurators in mass-customization strategies, but also provides useful managerial implications. By considering additional benefits, besides the utilitarian one, our study increases practitioners' awareness that sales/product configurators can be an effective tool to augment the consumer-perceived benefits of possessing a mass-customized product. Exploiting such sources of differentiation advantages as the fulfillment of consumers' needs for uniqueness and self-expressiveness can be one key for a company to augment the value of its mass-customization strategy. For those firms that are interested in fulfilling consumers' needs for uniqueness and self-expressiveness, our theoretical explanations and our empirical results highlight the importance of adopting sales configurators with higher levels of easy comparison, flexible navigation and focused navigation capabilities. This is another step in the direction of providing practitioners with prescriptive indications on how sales configurators should be designed to increase the benefits of possessing mass-customized products.

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APPENDIX A. Measurement instrument

Benefit-cost communication capability[a]

BCC1 Thanks to this system, I understood how the various choice options influence the value that this product has for me.

BCC2 Thanks to this system, I realized the advantages and drawbacks of each of the options I had to choose from.

BCC3 This system made me exactly understand what value the product I was configuring had for me.

Easy comparison capability[a]

EC1 The system enables easy comparison of product configurations previously created by the user.

EC2 The system lets you easily understand what previously created configurations have in common.

EC3 The system enables side-by-side comparison of the details of previously saved configurations.

EC4 The systems lets you easily understand the differences between previously created configurations.

User-friendly product-space description capability([a]

UFD1 The system gives an adequate presentation of the choice options for when you are in a hurry, as well as when you have enough time to go into the details.

UFD2 The product features are adequately presented for the user who just wants to find out about them, as well as for the user who wants to go into specific details.

UFD3 The choice options are adequately presented for both the expert and inexpert user of the product.

Flexible navigation capability[a]

FlexN1 The system enables you to change some of the choices you have previously made during the configuration process without having to start it over again.

FlexN2 With this system, it takes very little effort to modify the choices you have previously made during the configuration process.

FlexN3 Once you have completed the configuration process, this system enables you to quickly change any choice made during that process.

Focused navigation capability[a]

FocN1 The system made me immediately understand which way to go to find what I needed.

FocN2 The system enabled me to quickly eliminate from further consideration everything that was not interesting to me at all.

FocN3 The system immediately led me to what was more interesting to me.

FocN4 This system quickly leads the user to those solutions that best meet his/her requirements.

Utilitarian benefit([b]

UT1 This product is exactly what I had hoped for.

UT2 I could create the product that was the most adapted to what I was looking for.

UT3 I could create the product I really wanted to have.

Uniqueness benefit(b)

UN1 With this product, I will not look like everybody else.

UN2 With this program, I could design a product that others will not have.

UN3 With this product, I have my small element of differentiation compared to others.

Self-expressiveness benefit(b)

SE1	I could create a product that is just like me.
SE2	This product reflects exactly who I am.
SE3	This product is in my own image.

(a) Trentin et al.[56]
(b) Merle et al. [38]

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