9th International Conference on Mass Customization and Personalization – Community of Europe (MCP - CE 2020)
Re-innovating Business in the Digital Era
September 23-25, 2020, Novi Sad, Serbia

THE IMPACT OF ONLINE SALES CONFIGURATOR ON MASS CUSTOMIZATION VALUE: THE ROLE OF PSYCHOLOGICAL EMPOWERMENT

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Abstract: *This paper presents a proposal research model on the valuation of mass customization through empowerment. Through a literature review on empowerment and online sales configurator capabilities we have built a conceptual model. The purpose of this research is to see how sales configurators can increase the psychological empowerment with the mediation of hedonic value, and consequently increase the intention to purchase mass customizable product. Finally, we will present the project of our quantitative study to validate a conceptual model.*

Key words: mass customization (MC), psychological empowerment, sales configurator capabilities (SCCs), psychological ownership.

1. INTRODUCTION

Mass customization (MC) is a strategy used widely in several sectors such as apparel, cosmetic and automotive sector. The French brand *Guerlain* (guerlain.com) has invented its first customized lipstick. Clients can choose their own lipstick shade and case from a list of predefined choices by the brand. In the same way, *Terry* (byterry.com) offers the possibility of personalizing makeup palettes to its customers. MC also reaches geeks with customizable video game controllers such as *Xbox Design Lab* (xboxdesignlab.com) and *Nintendo Switch* (nintendo.com). In most cases, customers experience a co-creation process *via* the website of the brand. Hence, the researchers' interest on MC toolkits, whose role is to support the user throughout the product configuration process on the website, is growing. Different possibilities are represented, viewed, evaluated and priced. However, most of the previous researches have been limited to a descriptive approach of the concept of « MC toolkits » [1, 2]. The measurement of this concept in MC context was introduced by Trentin et al. at 2013 [3] then verified by Trentin et al. at 2014 [4] and Sandrin et al. at 2017 [5]. In the New Product Development (NPD) context, Füller et al., 2009 [6] got interested in the conceptualization of this notion.

Empirical research in MC has focused primarily on creating value for the consumer through product and co-design value [7, 8]. However, based on Schwartz's theory (2012) [9], we postulate that the valuation of MC can be done through empowerment where power is considered as a value in itself. In addition, consumer empowerment has been introduced many times in the value co-creation research via crowd sourcing [10, 11], But never in MC context. Our main objective is, on one hand, to see how consumer perceives the experience of co-creating product with the online sales configurator, and on the other hand to assess the influence of using these tools on the valuation of MC through psychological empowerment.

We will firstly present the conceptual framework of this study and then propose a conceptual model. Finally, we will present the project of our quantitative study to validate this conceptual model.

2. CONCEPTUAL FRAMEWORK

2.1. Online sales configurator capabilities

In MC context, the same large number of customers can be reached as in mass markets of the industrial economy, and simultaneously treated individually as in the customized markets of pre-industrial economies [12]. This offer allows users to develop their co-designed product under the application of tools, which give users real freedom of innovation. Franke and Piller (2002) [13] considered these tools as the "core of mass customization". A toolkit is a design-interface enabling trial-and-error experimentation process. It provides simulated feedback on the outcome of design ideas. Users can create a project or prototype, simulate it, evaluate its function, and then improve it until it perfectly suits to their expectations [14]. Once a satisfied design found, the product specifications are transferred to the company's production system. The personalized product is then produced and delivered to the customer. The result is an individual product or even an innovation [15]. The toolkits allow the customers to take an interactive part in product development. It faces two major

challenges in MC offer: (1) the heterogeneity of customer preferences; (2) the problems associated with the information transfer between the customers and the manufacturer. However, the success of such interaction system does not depend only on its technological capabilities, but also on the degree of integration with the sales environment, as well as the experience and satisfaction with the consumer towards the support. So, MC toolkits must contain much more than arithmetic algorithms so that to combine modular components [1].

In addition, some authors have highlighted the drawbacks of MC toolkits. According to Pine (1993) [16], wide assortment of options brought by co-designers can lead to "mass confusion" rather than "mass customization". Users may be overwhelmed by numbers of available options [17, 18, 19, 20]. Human capacity to process information is limited [21]. According to Eppler and Mengis (2004) [22], « the less a process is based on reoccurring routines and the more complex it is in terms of the configuration of its steps, the higher is the information load and the greater is the time pressure on the individual ». This leads to an increase of the information processing requirements, which can engender information overload. Connolly (1977) [23] found that excessive information leads to a decreased accuracy in decision-making. Schick, Gorden, and Haka (1990) [24] noted that the burden of information overload leads to confusion, an inability to set priorities, and a deficit in information recall. Overload has also been shown to reduce decision makers' ability to identify relevant information [25, 26, 27]. As a result, users may choose the standard solutions instead of customize a product [28], or even abandon the purchase.

In 2013 Trentin et al. developed a measurement scale for "sales configurator capabilities" (MC toolkits) in order to show how they increase the perceived value of mass customization and reduce the perceived complexity of MC. On the other hand, Füller et al. 2009 [6] developed a much more limited measurement of configuration tools under the name of "experienced tool support" to measure its impact on empowerment in the context of NPD. In addition, other researchers such as Dellaert and dabholkar (2009) [29] or Turner, Merle and Diochon (2011) [30] have introduced MC tools as a control variable to assess their influence on the values of MC in their conceptual model. For example, Dellaert and dabholkar (2009) [29] have shown that an online complementary service (present / absent) could improve the utilitarian value of MC. In the table below, we set out the different naming, dimensions and components of the online sales configurator capabilities (SCCs) (as we refer to them throughout this article).

2.2. Psychological empowerment

Different branches of empowerment can be applied on varies disciplines. For example, in the field of management, the notion of organizational empowerment is mentioned; In sociology, we talk about community or individual empowerment; In medical field, health empowerment is mentioned. While in marketing, empowerment concerns consumers: "consumer empowerment ».

Table 1. *Different namings and dimensions of SCCs*

Author	Naming	Dimensions
Von Hippel (2001) [1]	user Toolkits for innovation	• Learning by doing via trial and error • An appropriate solution space • User friendly toolkits • Module libraries • Translating user designs for production
Füller et al (2009) [6]	Experienced tool support	• Realistic understanding • Creative articulation
Dellaert et dabholkar (2009) [29]	Mass customization features	• Complementary online services (Visualization, Sales person interaction, Product adaptation) • Range of mass customization options
Turner et al (2011) [30]	Toolkit design features	• Scope of customization (number of modules, design freedom, product adaptation • Feedback (embedded/ interpersonal) • Comparative elements
Trentin et al (2013) [3]	Online sales configurator capabilities	• User friendly product-space description • Focused navigation • Flexible navigation • Easy comparison • Benefit-cost communication
Franke et Piller (2003) [31]	Mass customization toolkits	• Configuration software • Feedback tool • Analyzing tools

Consumer empowerment is associated to the idea of consumption control power and purchasing exercise [32]. Actually, today's consumers have more control over their consumption experiences; they became a « consumer actor ». Besides the consumption control, Wathieu et al. (2002) [33], authors of the pioneer work on psychological empowerment in the marketing field, discussed increasing power through decision-making experience as well. In this context, consumer has greater control over the marketing action of companies, the variables of marketing mix such as product definition, product information, place, promotion, etc. We distinguish therefore two different approaches of empowerment: « bottom up » versus « top down ». The first approach assumes that power comes directly from the consumer. There are groups, which spontaneously form the exchanging experiences to share the same attachment of a product or to set themselves up against

the power of the trading system. On these networks, one simple cluster can lead to a creation of pressure groups, which may bring political and social forces [34]. Conversely, in the second approach (top down), power is delegated by the company and passed to consumers with the impression that the consumer controls the product selection system. Under the digital era, certain tasks such as the choice of the technical or aesthetic characteristics of the product, its design, its distribution method or its price could have been conceded to the consumer. Empowerment is therefore close to an authorization granted for consumer to control certain variables. The company takes charge of supporting customers in mastering their consumption experiences and integrating them with value creation. This empowerment located at the crossroads of relationships and the merchant is a mix of exchanges and collaborative learning [35]. Such cooperation blurs the boundary of different status and makes consumers as co-producers, co-innovators, marketing assistants, relays, performers or even employees [36]. Then, the consumers got the chance to experience the feeling of control, mastery, overcoming obstacles, ability to make wise choices [37]. Some definitions of these two approaches are presented in the table below.

Table 2. *Approaches of empowerment*

Bottom up	Top down
« It is a process of personal growth, enabling people to assert their needs and influence the way in which they are met, but also participate as citizens within a community. » [41]. « Empowerment leads consumers to participate within their competences to a motion of power over their consumption » [32]	« Customer empowerment means controlled delegation {…} making available to employees whatever means are required for expected performance to be achieved » [42]. « Empowerment is a strategy firms use to give customers a sense of control over a company's product selection process, allowing them to collectively select the final products the company will later sell to the broader market. » [43].

These two approaches of consumer empowerment correspond to an understanding of the concept as a process. Cho and Faerman (2010) [38] distinguished structural empowerment from psychological empowerment. The structural or relational (process) emphasizes the management practices. On the contrary, other researchers consider empowerment as a result. From their proposition, psychological or motivational (result) emphasizes the cognitive learning of the individual. For example, Pruche (2015) [39] studied psychological empowerment in the purchase of a tourist stay. Here, consumer experiences the power through the available information on the internet of everything that may be relative to his stay. Thus, competences are not delegated by brands but acquired autonomously by consumers (*via* internet in this case). Füller et al, (2009) [6] conceptualized perceived empowerment as a process which may influence consumer product design and decision-making. The authors showed that participants feel their active contribution to the new products development and have the feeling that they had been taken seriously by the firm.Table 3 below presents definitions of the two approaches of empowerment.

Table 3. *Empowerment as a result vs. process*

Empowerment as a result	Empowerment as a process
Empowerment is a state characterized by several components: 1) competence, meaning, self-determination, impact; [44] 2) meaning, information, competence and self-control; [43, 45] 3) self-awareness, self-determination, self-efficacity [46]	Customer Psychological Empowerment is defined as a perceived control of the service process and outcome, which are influenced by the service providers' empowerment policies. [47] Customer psychological empowerment is defined as an intrinsic motivation based on cognitions about oneself as the latter relate to one's role in the market. [48]

Fayn et al. (2019) [35] defined empowerment as "a process of expansion of the power to act and the power of influence of the consumer, empowerment is deployed through collaborative approaches, conducted with or without the company". Wathieu et al (2002) [33] identified two factors which can influence empowerment: (1) widening of the choice range and (2) the consumer's ability to self-assess. The widening of the choice range is close to the contextual variable "level of personalization" which plays an important role in the valuation of MC. This variable does not always increase the perception of empowerment. The perception of empowerment depends less on the level of options selection (low or high) than on the consumer's ability of making choice. In other words, empowerment does not depend on large number of choices, but on the flexibility that one can have to define one's choices. Contrary to popular belief, a high consumer power can be perceived as a cost. The consumer ability to self-assess throughout the personalization process is an antecedent of empowerment. The perception of empowerment can be risky if the extension of choice is not accompanied by a proportional increase in "checkpoints" used to help guiding the consumer in decision-making [33]. Since the interest in making link between « psychological empowerment » and « online sales configurator », we think in particular the MC assistance software or feedback in MC toolkits treating as contextual variables in the valuation of MC. In other words, will sales configurators help increasing power in a MC experience? Will these tools make it possible to overcome the problem of losing power, which is the consequence from a "mass confusion" in the sense of Pine?

3. PROPOSITION OF CONCEPTUAL MODEL

3.1. Online SCCs and psychological empowerment

Sales configurator mean « 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 » [4]. These authors developed a scale measurement of five online SCCs: (1) flexible navigation, (2) focused navigation, (3) easy comparison, (4) user-friendly product and (5) benefit-cost communication. Trentin et al. (2014) and Sandrin et al. (2017) [4, 5] argued that these five online SCCs increase co-design value (hedonic and creative achievement benefits) and product value (utilitarian, self-expressiveness and uniqueness benefits). Otherwise, trial-and-error process within SCCs provides greater control for the consumer and higher autonomy and self-determination [49, 50]. In the field of information systems and in the context of NPD, Füller et al., (2009) [6] developed a measurement scale of a concept similar to SCCs called "experienced tool support" or "interaction tools". Two dimensions composed it: (1) allowing realistic product understanding and (2) enhancing consumers' creative articulation. They have shown through an empirical study that this variable influence a psychological empowerment. The consumers could make competent contributions only after a good understanding of the product. Thus, the toolkits allow consumers to actively experiment and modify products long before they actually exist. These authors showed that the more successful the support offered by the tool is, and the more helpful it is to control the development of new products, the more this tool will contribute to the perceived empowerment of consumers. We assume that this observation is also valid in the context of MC.

According to Portes (2018), appropriating web tools comes from a digital learning process. Learning is represented here as a process allowing the acquisition of knowledge and practices which are generating new skills. The theory of experiential learning of David Kolb (1984) states that experience is the source of learning. This experience is characterized by an increase in knowledge. During the MC experience, online sales configurator improve the learning process (Sandrin et al 2017; Kolb, 1984; Andresen et al., 2000). The SCCs must be presented under user-friendly product-space description offering panoply of possibilities of choice via "trial and error" process. So that the consumer can use his knowledge to quickly and easily obtain the desired product. We support the hypothesis on the link between SCCs and psychological empowerment on the theory of experiential learning of Kolb. During a MC experience, and through the optimal use of SCCs, the customer goes through a learning process allowing him to acquire skills in order to exercise more power. Therefore, we hypothesize:

H 1: Online SCCs have a positive influence on psychological empowerment.

Fuchs et al. (2010) [43] found that participants who are empowered to select the products for market exhibition have stronger demand for the underlying products than those who are not empowered to do so (measured by purchase intentions and willingness to pay). We suppose that perceived empowerment in MC experience leads to higher purchase intention.

H 2: Psychological empowerment has a positive effect on purchase intention.

3.2. Mediating effect of hedonic value in the relationship between SCC's and psychological empowerment

Hedonic value is defined by Franke and Schreier (2010) [8] as a positive emotional reaction which is elicited by the process of product self-conception. Huffman and Kahn (1998, p. 509) [17] noted, "Some consumers may find it fun to learn their preferences for a product". Franke and Schreier (2010) [8] showed that with the hedonic value perceived during the co-creation of a product using a MC toolkits, the customer assigns a higher value to product measured by willingness to purchase. Füller and Matzler (2007) [51] have shown that the visual aids may motivate the participants pleasure in the process of creating new products. Indeed, participants can gain pleasant when feeling supported by provided interaction tools. In 2009, Füller and his colleagues [6] stated that the experienced supporting tool has a positive effect on experienced enjoyment in NPD. In turn, the enjoyment generated by the toolkits strength the feeling of active participation and the feeling of empowerment in the new product development as well. We assume that this kind of effect can be mobilized in the mass customization.

H 3: Hedonic value is a mediator in the relationship between online SCCs and psychological empowerment.

H3a: online SCCs have a direct effect on hedonic value.

H3b: Hedonic value has a direct effect on psychological empowerment.

3.3. Mediating effect of psychological ownership in the relationship between psychological empowerment and purchase intention

Belk and Coon (1993) [52] claimed, "Creating the object is one of the clearest ways of incorporating it into the extended self". This means that the co-designed product not only create instrumental value but also psychological value for its creator [53, 54, 55, 56]. However, Pierce et al. (2003) [57] pointed out that most of the researches on psychological value was theoretical study and supported only by anecdotal evidence.

The concept of psychological ownership defines a state of mind associated with the feeling of possession [58]. "The state in which individuals feel as though the target of ownership or a piece of that target is 'theirs'." [64]**.** Pruche et al. (2015) [39] showed that the psychological ownership of the decision mediated the relationship between psychological empowerment and satisfaction with the purchase decision. In the context of MC, we assume that psychological ownership is linked

to the product but not to the decision. In a series of studies on MC value's antecedents, Franke and his colleagues have shown that co-creating a product allows the customer to perceive an appropriation value. The individuals who create an object interpret it as "their own". In addition, the appreciation of the object value is greater along with the stronger feeling of psychological ownership (measured by the WTP) [59].

Pierce et al. (2003) [57] proposed a psychological model of the antecedents[2] and consequences of psychological ownership. These authors suggested three antecedents of psychological ownership: (1) investing the self in the object (2) controlling the object and (3) getting to know the object. Here, « Controlling the object » refers to empowerment and « getting to know the object » refers to the online sales configurator capabilities, which enable consumer to better understand the functionalities of the product [6]. Furby (1978) [60] argued that when the subject is able to exercise an object control, it will be more capable to experience itself. The stronger this feeling of psychological ownership is, the higher one's appraisal of an object's value will be (measured as willingness to pay (WTP) or to accept) [59]. So we suppose that in MC consumers need support from company to better customize the product and to have a higher control and then perceive appropriation value.

H4: Psychological ownership is a mediator in the relationship between psychological empowerment and purchase intention.

H4a: psychological empowerment has a direct effect on psychological ownership.

H4b: psychological ownership has a direct effect on purchase intention.

The schematization of the conceptual model structure is presented below.

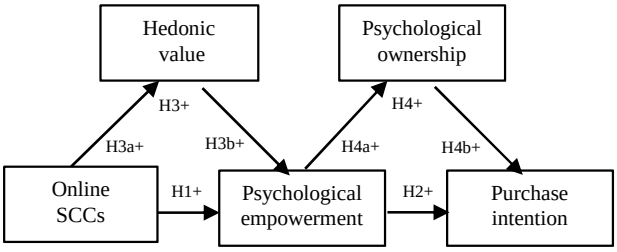

Fig. 1. *Conceptual model*

4. CONCLUSION

The main goal of this study is the construction and validation of a conceptual model by considering the role of psychological empowerment in explaining how certain capabilities of configurators help to augment the purchasing intention of potential customers. The literature review allowed us to have a first schematization of the relationship between the online sales configurator capabilities and psychological empowerment with the mediation of hedonic value. The model includes also the mediator role of psychological ownership on the relationship between psychological empowerment and intention to purchase a customizable product. A quantitative study with 500 people will be set up in the aim of tasting the validation of the psychometric scales. Then, the confirmatory analysis using SPSS will be applied. Finally, a structural equations model will be done on AMOS. Hence, several individuals and contextual variables must be introduced in the model before its assessment. For example, Franke et al., (2010) noted that some variables can reduce the level of skill such as the user-friendly product space description. In addition, SCCs can provide online simulation with feedback. So that, the design process will be easy to use and even novice designers could create a product, which fit their needs within only few minutes [1, 63].

The managerial contribution of this paper is to help managers create online SCCs that increase the perceived benefits of MC. In addition, we try to show interest to enhance psychological empowerment in MC. Our aim academic contribution is to propose an integrative model of the valuation of MC through psychological empowerment. We will first develop empowerment measurement scales and SCCs in the context of MC. Our objective is to test this model in the context of private consumption (versus public) which has never been studied yet in previous research on MC.

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