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Abstract:

The primary argument in favor of mass customization is the delivery of superior customer value. Using willingness-to-pay (WTP) measurements, Franke & Piller (2004) have recently shown that customers designing their own watches with design toolkits are willing to pay premiums of more than 100% (ΔWTP). In the course of three studies, we found that this type of value increment is not a singular occurrence but might rather be a general phenomenon, as we again found average ΔWTPs of more than 100% among customers designing their own cell phone covers, T-shirts, and scarves. Building on this, we discuss the sources of benefits that are likely to explain this tremendous value increment. We argue that compared to conventional standard products, a mass-customized product might render the following utilitarian and hedonic benefits: (1) First, the output might be beneficial as self-designed products offer a much closer fit between individual needs and product characteristics. In addition to this mere *functional benefit*, extra value might also stem from (2) the *perceived uniqueness* of the self-designed product. As the customer takes on the role of an active co-designer, there may also be two general 'do-it-yourself effects': (3) First, the process of designing per se is likely to allow the customer to meet hedonic or experiential needs (*process benefit*). (4) Customers may also be likely to value the output of self-design more highly if they take pride in having created something on their own (instead of traditionally buying something created by somebody else). This is referred to as the *'pride of authorship'* effect.

Keywords

Mass customization, self-design, DIY, toolkits for user innovation and design, types of benefits, willingness to pay (WTP), Vickrey auction.

Introduction

Generally, new products are developed in response to the average needs of a specific target market. Consequently, they are also limited to satisfying the average needs of customers. They are 'one size fits all' or at least 'one size fits one segment' products. Obviously, this traditional approach makes sense if the respective market or clustered segment is large enough, and if customer preferences within this segment are relatively homogeneous. Certain customers with very unique needs then remain, to a certain degree, unserved – even in seemingly mature markets (the 'dark side of the market'). More often, however, these customers are not the exception but the norm. We know from prior research that poor customer fit (i.e., a weak match between the individual's needs and the product's characteristics) has often been used to explain the high flop rates of new products (Cooper, 1999; Crawford, 1979; Shanklin & Ryans, 1984).

Only recently, the coincidence of two technological developments paved the way for a radical new form of manufacturer-customer interaction which enables manufacturers to respond to each customer's individual needs with an individual product (Franke & Schreier, 2002). First, new communication tools like the Internet have allowed manufacturers to handle each customer's product needs individually and in a rapid, cost-effective manner. Second, mass-customizing production methods have reduced the fixed costs of tooling in manufacturing dramatically (Zeid, McDonough & Kamarthi, 2001). These advances in flexible manufacturing systems and modularization have brought down the costs of single-unit quantities to near mass-production efficiencies (e.g., Pine, 1993). Consequently, there seems to be a promising opportunity to cope with the 'dark side of the market'.

In addition, empirical studies on the sources of innovation have revealed that, contrary to conventional wisdom, users can be highly innovative. In both the industrial and consumer goods fields, customers, or more generally users, are often found to be the initial developers of products, prototypes, and processes which later gain commercial significance (von Hippel, 2002). Furthermore, studies have demonstrated that up to 30% of users surveyed report that they have developed a new product for personal or in-house use (von Hippel, 2002). This supports the idea that innovative users are not a rare occurrence. Thus, customers might have a lot more to share than vague information about their needs. They can indeed be highly innovative and take on problem-solving tasks themselves.

Against this background, it seems both possible and reasonable to outsource certain tasks in designing new products to customers. This is where mass customization comes into play: A manufacturer can equip its customers with a set of tools which enable them to convert their ideas, preferences, and tastes into products. Their final, individual solutions are then produced by the manufacturer, who takes advantage of mass customization production systems. Customers equipped with design toolkits can already create their own unique products, such as shoes, watches, or bags (see www.mass-customization.de for further examples). Hence, customers with heterogeneous needs are given the opportunity to get exactly what they want.

Recent empirical work in the field of mass customization has revealed that customers designing their own products with design toolkits might be willing to pay premium prices. Whereas Kamali & Loker (2002) found that users designing their own T-shirts are generally prepared to pay more for individualization, Franke & Piller (2004) aimed to measure the value increment for customized (as opposed to standard) products explicitly through real

auctions. Employing a watch toolkit, they revealed that the average value increases by up to 100% on an *interpersonal* level.

On this basis, the aim of this paper is to extend the preliminary findings of Franke & Piller (2004). In particular, we set out to analyze whether this value increment is a singular finding or rather a general phenomenon. For this purpose, we measured the value increment perceived by customers designing their own cell phone covers, T-shirts, and scarves. In addition, our studies aim to measure the value increase on an *intrapersonal* level.

The paper is structured as follows: The next section gives a brief overview of the core of this manufacturer-customer interaction from the customer's perspective, that is, the design toolkits themselves. This is followed by a brief review of literature on the potential outcome of mass customization – the value increment of self-designed products. Next, we describe the method applied in the study and then present our empirical findings. On this basis, we discuss the types of benefits that are likely to explain the value increment of mass-customized products. We conclude by pointing out a number of future research possibilities.

Manufacturer-customer interaction using design toolkits

Mass customization is a buyer-centric strategy in which the locus of control – with regard to product design – resides with the individual customer (Wind & Rangaswamy, 2001). In this light, it seems obvious that the success of outsourcing certain design tasks to customers, that is, the success of mass customization, depends heavily on efficient and effective manufacturer-customer interaction. The interaction systems for mass customization, known as configurators, choice boards, design systems, co-design platforms, and toolkits, are responsible for guiding the customer through the design process (we use the term toolkit

following von Hippel, 2001). In practice, these toolkits are very heterogeneous in terms of what the customer can do and how he can do it.

Based on his exploratory studies, von Hippel (2001) proposes that successful design toolkits support five important functions: Problem solving in general and problem solving with regard to product development and design usually follow patterns of trial and error and learning by doing. (1) Hence, toolkits have to enable complete trial-and-error cycles in order to efficiently allow customers to create their individual designs. High fidelity in interim and final user designs provides customers with relevant feedback. The complete iterative design process, including testing, evaluation and any necessary improvements, can then be handled by the individual customer. (2) Next, successful toolkits should offer an appropriate *scope*. The scope of the toolkit describes the customer's design possibilities, that is, the degrees of design freedom. Whereas a toolkit with a very narrow scope might only enable the user to choose components passively from lists (such as typical mass-customization websites like www.cannondale.com), a wider scope will allow users to create novel designs actively (like the toolkit for cell phones at www.designyourhandy.de). Of course, the customer can only be provided with design freedom within the constraints of production. (3) Third, successful toolkits allow users to work in their own design language, enabling customers to use skills they already possess (*user friendliness*). (4) Furthermore, module libraries should be offered to customers, as individual designs will rarely be novel in all aspects of the product. The creative design process can then focus on certain relevant aspects. This should guarantee an efficient investment of customer-based resources. (5) Finally, once the customer finds a satisfactory solution, his/her design is automatically translated into the language of the production system without requiring revision by the manufacturer.

Empirical findings on the value mass-customized products deliver to customers

As noted above, the main objective of mass customization is to provide superior customer value. It is assumed that a certain value increment stems from increased satisfaction with the individualized product. This value increment is said to make customers willing to pay price premiums (e.g., Wind & Rangaswamy, 2001) – as long as the premium is commensurate to the perceived added value (Broekhuizen & Alsem, 2002). Despite the fundamental relevance of this aspect, only one very recent study has aimed to assess empirically the value created by mass-customized products (Franke & Piller, 2004). In the course of four studies (n=467), they measured users' willingness to pay (WTP) for both self-designed and standard watches. Irrespective of the method employed (contingent valuation or Vickrey auctions), they found an enormous value increment. The mean WTP for a standard watch using the theoretical contingent valuation method (or the Vickrey auction, alternatively) was €23.20 (€7.10). In contrast, the average WTP for the self-designed watch was €48.50 (€15.50), implying an impressive value increment of 109% (118%) (Franke & Piller, 2004).

Although this highlights the tremendous potential of mass customization, it remains questionable whether this is a singular occurrence or a general phenomenon. Do mass-customized products create value in general, or is this finding specific to the underlying watch toolkit? In addition, it remains unanswered whether these findings are valid with regard to measurement aspects, as they measured the value increment on an *interpersonal* level. In the course of one study, probands designed their own watch and then participated in the auction (which yielded the WTP for the self-designed watch). In another study, other probands bid on selected standard watches (thus yielding the WTP for the standard models). Will these findings also hold in an *intrapersonal* setting?

Study method

Setting. The study was designed as follows: Probands used a PC to design their individual products with a real toolkit. Having finished the design process (with no time constraints), probands compared their own designs with the best standard product (which they could select from a predefined set). Next, probands were asked to submit *binding sealed bids* for both the self-designed and the standard product (by means of a Vickrey auction, see below). Once they had submitted their bids, probands completed a brief questionnaire containing questions related to the validity of WTP measurement. Note that probands were instructed that if both bids were accepted, a random drawing would decide which of the two products the proband received. Strategic behavior could therefore be avoided (e.g., bidding high on one and low on the other product; Skiera & Revenstorff, 1999; Rothkopf & Teisberg, 1990).

Research objects. As noted above, toolkits themselves are heterogeneous in practice. Therefore, we selected three different toolkits in order to increase the external validity of our study. One toolkit allows users to design cell phone covers (www.designyourhandy.de), another to create T-shirts (www.shirtcity.com), and the third to design scarves (www.wildemasche.de). These toolkits constitute a sound representation of the toolkits in practical use in the B2C arena.

The toolkit to design cell phone covers offers a relatively generous solution space. The entire face can be designed actively, and instant visual feedback allows efficient trial and error. Users can easily integrate graphic elements (e.g., their own pictures or graphics), which can be moved back and forth to adjust their exact placement on the cover. This means that the toolkit allows users to create essentially unique designs. On the other hand, this set of tools does not provide the user with a module library, thus requiring the customer to start his design

completely from scratch. The T-shirt toolkit offers a high degree of user-friendliness. Customers are given the opportunity to draw from a rich module library. The user can either choose elements from a predefined set of design options (more than 500) or create any text to be displayed in different colors, sizes, and styles. Compared to the cell phone cover toolkit, this toolkit is easier to use but also much more restricted in terms of what the user can actively design. The scarf design toolkit, in contrast, is rather complex to use and the fidelity of the scarf's design is rather weak. As in the T-shirt toolkit, there is a huge set of predefined design options (e.g., more than 66 background designs and more than 140 pieces of clip art), and the user can create any text in different colors, sizes, and styles. In contrast to the T-shirt toolkit, however, this toolkit allows users to shift design elements instantly. Hence, as in the cell phone cover toolkit, the user can move elements back and forth until the desired placement is found. In addition, the scarf toolkit provides the user with some very basic design tools, such as a brush or a pen to create drawings.

In order to measure the value increment, we needed a valid reference point. Therefore, we selected a set of standard products in each product category (ten standards for each toolkit). These standards were of exactly the same quality as their potential self-designed counterparts. In a pilot study (n=48), we observed that every proband found a satisfactory standard product which met his/her needs among the ten standards. Furthermore, when interviewing probands we found that the standards were consistently perceived as highly realistic and appealing (representing 'real-life' offers). Thus, we were able to support the assertion that our measurement of the value increment is not in danger of inducing a 'straw man' effect (which in this case would imply consciously selecting 'ugly' objects of comparison to 'produce' large differences, cf. Murphy & Myors, 1998).

Sample. A total of 185 students at the Vienna University of Economics and Business Administration participated in our study. Probands were 23 years old on average (SD: 3.18), with 49% female and 51% male. 60 probands designed a cell phone cover, 63 a T-shirt, and 62 a scarf. There are no statistical differences between subsamples with regard to age and sex.

Measuring the value increment. The value increment of a self-designed product compared to a standard product is measured by the customer's WTP. The difference between a user's WTP for the mass-customized product and the standard product yields the value increment of self-designed products (ΔWTP). Going into more detail, we employed Vickrey auctions to obtain valid measurements of willingness to pay. A Vickrey auction is an auction in which the participants' bids are sealed and each bidder is unaware of the other bids. The item is awarded to the highest bidder at a price equal to the second-highest bid (Vickrey, 1961). It can be shown both empirically and using game theory that the bidder's dominant strategy is to bid his/her actual maximum willingness to pay (e.g., Cox et al., 1982, Hoffmann et al., 1993). Furthermore, Skiera and Revenstorff (1999) and Noussair et al. (2004) have shown that Vickrey auctions enable highly reliable and valid measurement of consumers' WTP for private goods. The appropriateness of this method for our study with regard to reliability and validity is briefly outlined below.

Reliability is assessed by comparing WTP (for self-designed and standard products) and ΔWTP means (the difference between WTP for self-designed and WTP for standard products) across daily subsamples (Wertenbroch & Skiera, 2002). WTP means for the self-designed and the standard cell phone covers do not vary significantly between subgroups (ANOVA: $F=0.142$, $p>0.10$ and $F=0.656$, $p>0.10$, respectively). The same holds true for T-shirts ($F=1.269$, $p>0.10$; $F=0.156$, $p>0.10$) and scarves ($F=0.332$, $p>0.10$; $F=0.096$; $p>0.10$). In

addition, we did not observe any differences with regard to ΔWTP (cell phone cover: F=0.433, p<1; T-shirt: F=2.312; p<1; scarf: F=0.770; p<1). This suggests a reliable measurement of WTP for both self-designed and standard products.

Validity is assessed by analyzing the correlation between WTP and selected measurement items (Skiera & Revenstorff, 1999, Wertenbroch & Skiera, 2002). The results are summarized in Table 1. The WTP for *standard* products should generally correlate positively with product interest and purchase intention. All coefficients show the expected positive direction and are highly significant. The WTP for *self-designed* products also correlates positively – as required – with product interest and purchase intention. In addition, the WTP for self-designed products as well as ΔWTP is positively and significantly correlated with product satisfaction and perceived product superiority (compared to the standard product). These findings point to a sound degree of validity.

Insert Table 1 about here

Findings

The results of our WTP measurement in the course of the Vickrey auctions are summarized in Figure 1. The self-designed cell phone cover produces an impressive and highly significant value increment of 207% (mean WTP for standard product: €3.7 [SD: 4.5]; mean WTP for self-designed product: €11.4 [SD: 9.5]). This indicates that on average subjects were willing to pay €7.6 more for designing their own product as opposed to picking out a standard product (SD: 8.5). The self-designed T-shirt delivers a 113% value increase (mean WTP for standard product: €6.0 [SD: 4.6]; mean WTP for self-designed product: €12.8 [SD: 8.8]). Thus, self-designed T-shirts skim €6.8 on average (SD: 6.4). Furthermore, probands are

willing to pay an average of 106% more for a self-designed scarf, implying a ΔWTP of €5.2 (SD: 7.8; mean WTP for standard product: €4.9 [SD: 4.7]; mean WTP for self-designed product: €10.1 [SD: 9.4]). All differences appear to be highly significant ($p < 0.001$). Across all three subsamples, the average bids amount to €4.9 for a standard product and €11.4 for a self-designed product. This corresponds to an average value increment of 134% (see Figure 1). Therefore, the findings reported by Franke & Piller (2004), who identified an average ΔWTP of 118%, do not constitute a singular occurrence: Mass-customized products do appear to create substantial value increments in general.

Insert Figure 1 about here

Going beyond mean statistics, we find that toolkits for mass customization might not be suited to every customer (von Hippel, 2001). The absolute value increment ranges from €-13 (!) to €40 (!). This implies on the one hand that mass-customized products do not deliver *any* value increment ($\Delta WTP \leq 0$) for a certain fraction of users (12%). On the other hand, there is also a group of subjects who seem to derive great benefit from such products. If we consider, for instance, the top 50% or 25% of the entire sample, absolute ΔWTP jumps from €6.5 to €11.9 (SD: 7.1) or to €19.3 (SD: 6.9), respectively.

Discussion: Types of benefits of mass-customized products

The high variance of the value increment within all three subsamples implies that specific perceptual factors might underlie the value created by mass-customized products from an individual's perspective. Knowing the composition of this value is not merely of theoretical interest; it constitutes success factors for mass customization in general and for the design of future interaction toolkits in particular. To date, hardly any explanations are available as to

what causes users to attribute high value to designing their own products with mass customization toolkits. This section is devoted to discussing the types of benefits that are likely to explain the value increment.

In brief, a customer may perceive the self-designed product, as opposed to the conventional standard product, (1) to be better tailored to his individual needs (*functional benefit*) and (2) to be more unique (*perceived uniqueness*). In addition, there might also be some 'do-it-yourself effects' (as the user actively engages in problem-solving instead of rather passively picking a product off the shelf). (3) First, the *process* of using a mass customization toolkit itself might imply additional costs but also additional benefits to the user, which may influence the perceived value created (*process benefit*). (4) Second, as the users themselves act as designers, they will also be likely to value the output of the self-design process more highly: They might experience strong feelings of pride, which in turn could increase the value created ('pride of authorship' effect). Each component is discussed in detail below.

(1) Functional benefit. In general, a customer may be able to accomplish specific tasks using a given product. Therefore, it is the product's properties, such as its physical characteristics and features, that create value in the sense that the product helps the user to reach an intended outcome in a satisfactory manner (Fournier, 1991; Prentice, 1987). The value of individualization in this context is defined as the increase in utility a customer derives from the individualized product compared to the best standard product available (Du & Tseng, 1999). To date, this functional benefit has been the prime argument in favor of mass customization: A customer will come up with a self-designed product solution that is potentially much closer to his/her individual needs (e.g., von Hippel, 2001). This better fit between product and individual preferences might include technical as well as design aspects,

thus covering a broad spectrum of possible characteristics depending on the product category in question. In the case of a user-designed watch this might be the design, while in the case of statistics software it might be a new econometric test.

(2) Perceived uniqueness. In general, "people buy things not only for what they can do, but also for what they mean" (Levy, 1959, p. 118). In addition to the product's functional uses, purchasing a product thus also implies a symbolic product meaning (Ligas, 2000). More specifically, consumers often acquire things in order to *feel* different from others, and selected material possessions are used to *express* the customer's individuality (Tian, Bearden & Hunter, 2001). This need for uniqueness, for example, drives customers to purchase novelty or original goods, handcrafted goods, vintage or antique goods that are not available in mass quantities; or they may decorate, arrange and display (a composition of) goods in such a way that they are one of a kind (for an overview, see Tian, Bearden & Hunter, 2001). Furthermore, people generally tend to attribute greater value to products that are unique than to ones that are common (Brock, 1968; Fournier, 1991; Fromkin, 1970). In an empirical study, for example, this effect was assessed in the following way: 248 students were asked to evaluate 125 standard plastic watches. They had to state their WTP for the watch they personally preferred most on a contingent valuation scale (median: €45). Next, they were asked how much they would pay if they were guaranteed that the respective watch would be unique. Surprisingly, this option increased their WTP from a median of €45 to €70, indicating a value increase of 64% (Schreier, 2004). As even simple mass-customizers offer an almost endless number of options (Franke and Piller, 2004), it seems very likely that self-designed products might also be perceived as highly unique.

(3) Process benefit of self design. As the customer devotes his/her time and effort to designing an individual product (which incurs costs to the user), it seems plausible that this will have a negative impact on the value of the outcome (compared to the reduced effort involved in picking a standard product off the shelf). Irrespective of the time needed to design one's own product, the customer's exposure to complexity is also likely to be perceived in a negative light. One argument often used against mass customization is the excess variety customers have to deal with (Huffman & Kahn, 1998), which Pine (1993) termed 'mass confusion'. Thus, these extra costs might negatively impact the perceived value of self-designed products.

On the other hand, the process of designing one's own product might also *add* value if it is perceived as a self-rewarding process. Intrinsically rewarding activities in general are associated with characteristics like the satisfaction of curiosity, opportunities to experience and attain mastery of a particular topic, entertainment value, and novelty (Kruglanski, 1975). Empirically, we often observe that people seem to derive an intrinsic benefit from 'doing it themselves'. Csikszentmihalyi (1996), for example, found that individuals seek out engaging activities like rock climbing or chess because they are intrinsically motivating. A study of the traditional do-it-yourself (DIY) market further revealed that the majority of German do-it-yourselfers engage in these activities in the first place because they perceive the 'doing' itself as rewarding, enjoyable, and as a fun experience (Institut für Freizeitwirtschaft, 1997, see also Williams, 2004). Further parallels can also be drawn from theoretical and empirical work on open-source software. Here people participate in software development for free because they enjoy working on creative tasks and perceive writing or improving software as fun, creative, and interesting (e.g. Gabriel & Goldman, 2001; Shah, 2003).

In the field of mass customization, it also seems likely that a customer designing his own product will enjoy the design act itself. As the reward of the process (the customer-designed product) is endogenous to the activity (the act of designing) and both are closely linked, the behavior itself should be experienced as rewarding (Freitag & Higgins, 2002). Thus, this positive process benefit might in turn positively impact the value of the outcome of the process, that is, the self-designed product.

'Pride of authorship'. Whereas the positive effect of designing one's own product constitutes an intrinsic process-oriented benefit (the benefit of *doing* it oneself), the 'pride of authorship' effect describes the output-oriented benefit of *having done it* oneself. Consider, as an extreme example, people who complete 5000-piece jigsaw puzzles. The self-rewarding process per se might explain why people engage in the activity in the first place, but not why they value the outcome so highly (far beyond the objective value) and why they proudly display the final jigsaw puzzles on their walls. It seems that the positive outcome of such processes constitutes positive feedback, which gives the individual a strong feeling of pride.

Theoretical support for the 'pride of authorship' effect can be drawn from the general literature on pride and from the theory of the extended self. First, pride in general is defined as an emotional response to an evaluation of one's competence (Harter, 1985). In particular, pride is associated with achievement and depends on a favorable outcome attributed to one's own efforts (Lea & Webley, 1997; Weiner, 1985). Weiner (1985) illustrates this by quoting Kant: "everyone at a meal might enjoy the food, but only the cook could experience pride." Second, Sartre (1943) argued that objects in general may be incorporated into the extended self by control or mastery, for example, and by creation. By investing attention, time, and effort in an object, 'psychic energy' is transferred from the self to the object (Csikszentmihalyi &

Rochberg-Halton, 1981). Thus, the evolving objects have grown or emerged from the self (Belk, 1988). It is for this reason that artists may find it difficult to sell their work, that is, to part with an object in which they have invested both their energy and themselves and which they are proud of having created.

In the mass customization arena, similar effects are likely to occur. A user completes the entire design task in an autonomous and controllable way, with choice and discretion, and gets instant feedback from the design toolkit through trial and error. Hence, by designing their own products, users are likely to experience strong feelings of pride, and they may therefore value the outcome more positively than they would value a standard model of the same product or the same product designed by a 'design agent'. Implicitly, this effect is already stressed by marketers of mass-customized products. Brands are extended to the consumer by creating company/customer co-brands such as 'Dell 4 ME', 'My Adidas', or 'My Yahoo' to increase perceived customization, to enhance identification of the self-designed product as 'his or her product', and to stress one's achievement (Liechty et al, 2001; Wind & Rangaswamy, 2001).

Conclusion and Future Research

In three studies, we found that irrespective of the underlying toolkit (cell phone cover, T-shirt, and scarf), the value increments of self-designed as opposed to standard products add up to more than 100%. Considering the findings of Franke & Piller (2004) on the watch market, we may conclude that mass-customized products create value for customers in general.

Now the burning question is how this can be explained. This might be particularly relevant to manufacturers employing mass customization in order to skim the market. Conceptualizing

the value composition, we argue that the customer might benefit from (1) the functional benefit (better fit between individual needs and product characteristics), (2) the perceived uniqueness of the self-designed product, (3) the process benefit (meeting hedonic or experiential needs by 'doing it oneself'), (4) and the 'pride of authorship' effect (taking pride in having designed the product oneself). Future research should build on this by extending our proposals and providing empirical data. This could be done, for example, by employing structural equation modeling with a view to explaining ΔWTP.

Furthermore, our findings suggest that the toolkit itself might also impact the value created, as the value increment between the three toolkits differed substantially. Whereas the value increment of the scarf toolkit added up to 106%, the cell phone cover toolkit produced a ΔWTP of 204%. The latter toolkit, for example, is the one that offers the highest degree of design freedom. This suggests that a toolkit's solution space might impact the value created. In addition, the scarf toolkit, which appears to have the lowest levels of user friendliness and fidelity, also showed the highest rate of 'non-value creators' (19% with $\Delta WTP \leq 0$). On the other hand, the T-shirt toolkit, which turned out to be the most user-friendly tool, showed the lowest '$\Delta WTP \leq 0$' rate of 6%. In order to delineate empirically the effects of toolkit characteristics on the value created, we suggest using a flexible toolkit with systematically varied characteristics.

The results of such research efforts could be of considerable value for the fast-growing number of manufacturers which employ mass customization.

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Item	WTP for standard product (n=185)	WTP for self-designed product (n=185)	ΔWTP (value increment) (n=185)
Product interest[a]	0.190**	0.252**	n.a.
Purchase probability[b]	0.225**	0.136†	n.a.
Product satisfaction[c]	n.a.	0.149*	0.154*
Product superiority[d]	n.a.	0.231**	0.302**

†p<0.10 (two-sided)
*p<0.05 (two-sided)
**p<0.01 (two-sided)
[a]measured on a 5-point scale (1=very low; 5=very high)
[b]measured on a 5-point scale (1=not at all probable; 5=very probable)
[c]measured on a 5-point scale (1=not at all satisfied [with self-designed product]; 5=very satisfied)
[d]measured on a 10-point scale (1=self-designed product corresponds to standard product; 10=is much better than standard product)

Table 1: Correlation analysis of WTP with validity measures

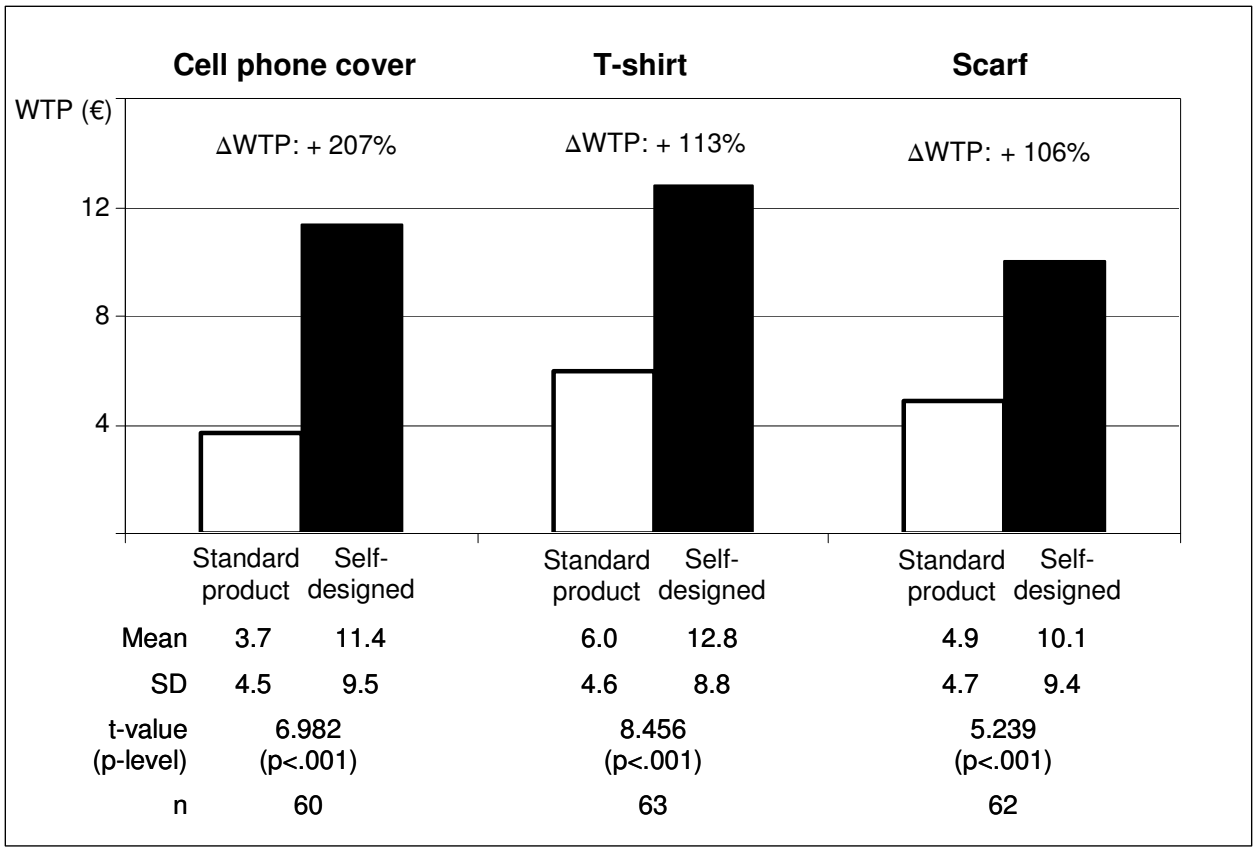

Figure 1: Findings: WTP for self-designed and standard products