

# Testing the Value of Customization: When Do Customers Really Prefer Products Tailored to Their Preferences?

Recently, researchers have paid increasing attention to the marketing strategy of customization. A key assumption is that customized products create higher benefits for customers than standard products because they deliver a closer preference fit. The prerequisite for this effect is the ability to obtain precise information on what customers actually want. But are customers able to specify their preferences that precisely? Several theoretical arguments raise doubts about this, implicitly challenging the value of customization. The authors conduct two studies in which they find that products customized on the basis of expressed preferences bring about significantly higher benefits for customers in terms of willingness to pay, purchase intention, and attitude toward the product than standard products. The benefit gain is higher if customers have (1) better insight into their own preferences, (2) a better ability to express their preferences, and (3) greater product involvement. This suggests that customization has the potential to be a powerful marketing strategy if these conditions are met. In the opposite case, firms willing to serve heterogeneous customer preferences need to adapt their customization systems in such a way that they explicitly address the customers' inability to provide valid preference information.

**Keywords:** mass customization, self-design, toolkits for user innovation and design, heterogeneous preferences, segmentation

In this article, we measure the benefits customers derive from customized products and the factors that affect the magnitude of the benefits achieved. In recent years, researchers and practitioners have paid increasing attention to the marketing strategy of customization (e.g., Dellaert and Stremersch 2005; Gilmore and Pine 2000; Kotha 1995; Syam, Ruan, and Hess 2005; Varki and Rust 1998). These efforts have been driven by both the supply side and the demand side. There is a constantly increasing supply of technology that facilitates customization. The production costs for individualized offerings are declining (Duray et al. 2000; Kahn 1998; Peppers and Rogers 1997), and the Internet has led to a decline in the costs of communication with customers (Ansari and Mela 2003; Sheth, Sisodia, and

Sharma 2000). Research has also found ways to reduce the customer effort required (Alba et al. 1997; Diehl, Kornish, and Lynch 2003; Randall, Terwiesch, and Ulrich 2005, 2007). At the same time, the customers' demand for customized products has increased, and customer preferences have become increasingly heterogeneous in many markets (Gilmore and Pine 1997; Smith 1956). Scholars and practitioners alike have high expectations regarding the promise of customization (Ansari and Mela 2003; Sheth and Sisodia 1999). As Simonson (2005, p. 42) notes, "It has been assumed in recent years that the age-old practice of targeting market segments is dominated and will be displaced by individual marketing."

However, some scholars have questioned the merits of customization because it requires extensive customer participation (e.g., Fang 2008; Huffman and Kahn 1998; Simonson 2005; Zipkin 2001). Spectacular failures in customization, such as Levi Strauss's "Original Spin" jeans and Mattel's "My Design Barbie" (see Franke and Piller 2004), appear to support these doubts. Moreover, customers sometimes prefer the default configurations provided by the producer and fail to recognize the opportunities offered (Hill 2003).

Delivering positive value to the customer is a prerequisite for the long-term success of any customization strategy. Therefore, several scholars have begun to analyze the benefits customization strategies create for customers. However, empirical findings have yielded mixed results. Franke and Piller (2004), Schreier (2006), and Franke and Schreier

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(2008, 2009) compare students' willingness to pay (WTP) for both standard and customized products in different low-price consumer goods categories and find a higher WTP for the customized products. Schoder and colleagues (2006) measure consumer acceptance of traditional and customized newspapers using conjoint analysis and conclude that people prefer customized newspapers but are not willing to pay more for them than for traditional ones, thus questioning the benefits of customization. The stimuli provided in that study were relatively abstract (operationalized as verbal stimuli: "regular newspaper" versus "personalized newspaper"). Bardakci and Whitelock (2004) investigate consumer agreement or disagreement with statements related to the benefits and disadvantages of customized cars. The results show that though people seem to be interested in customized products, only 58% of the participants claimed to be willing to pay a slight premium for a customized car. Again, "customization" was only given as an abstract representation, meaning that the participants did not actually experience customized products, which casts doubt on the validity of the findings.

These conflicting findings call for further systematic analysis of the benefits created by customization compared with other strategies and of the conditions under which those benefits take effect. When possible, it would appear useful to employ controlled experiments and actual products as experimental stimuli to overcome the limitations of abstract stimuli. To permit general conclusions, a broad and representative sample is required because special-interest or convenience samples might differ from the mass consumer market in important aspects.

In this research project, we attempt to take this next step by empirically analyzing the benefits of customization (compared with segmentation and mass marketing) and the variables that moderate these benefits. For this purpose, we conducted two studies. Study 1 is an experiment with a representative sample of 1589 participants in which we simulated the three different strategies of customization, segmentation, and mass marketing and then measured the customers' resulting subjective benefit attributions. We selected the product category of newspapers because the strategy of customization is currently being discussed in this area (Schoder et al. 2006). We find that newspapers individualized on the basis of stated customer preferences generate significantly higher benefits for customers in terms of WTP, purchase intention, and attitude toward the product. We also find that the magnitude of such benefits increases in line with the person's insight into his or her own preferences and ability to express them.

Study 2 aims to complement this research by enhancing the validity and generalizability of Study 1. For this purpose, we used a different methodology, comprising a survey, latent construct measurement, and structural equation modeling. Again, we used a representative sample (1039 participants). In addition to replicating the analysis in the newspaper market, we tested our hypotheses in four diverse product categories: fountain pens, kitchens, skis, and cereals. The findings in the newspaper market are similar to Study 1, thus validating our findings. In the other product fields, we also find that customization results in increased

benefits for customers. Again, the magnitude of the benefits created is affected by the person's insight into his or her preferences and ability to express them. Moreover, we find that product involvement affects the benefits obtained from customization in these five product categories.

## Research Hypotheses

### *The Benefits of Customized Products*

It is a straightforward economic argument that a closer fit between preferences and product attributes brings about increased benefits for the customer (see Simonson 2005). The crux of the matter is that true customer preferences may differ from expressed preferences on the basis of which the product is customized. As with any measurement task, the companies' measurement of customer preferences is likely to contain a true component and an error term or random component (Morrison and Silva-Risso 1995). To ensure valid measurement, a customer must be aware of his or her preferences and must be able to express them (Simonson 2005). However, consumer preferences are often poorly defined. Research on consumer decision making (see Bettman, Luce, and Payne 1998; Fischhoff 1991; Slovic 1995; Yoon and Simonson 2008) suggests that preferences are often constructed on the basis of how the options are framed when the consumer needs to make a decision. Given the nearly infinite solution spaces of even simple mass customization configurators, Huffman and Kahn (1998) warn that the preferences consumers construct when faced with the challenge of defining a product are almost certainly a local optimum, if not an almost random choice; the authors use the term "mass confusion" for such futile mass customization endeavors. Thus, it is not easy to transfer "sticky" customer preference information from a customer to a producing company (Morrison, Roberts, and Von Hippel 2000; Von Hippel 1994). On the whole, the relevant literature indicates that the measurement of an individual customer's preferences might contain a large error term.

In such a case, it is questionable whether customized products are more beneficial to customers than standard products (Kramer 2007). It could even be argued that in extreme cases, an adept segmentation strategy might yield higher benefits for customers than customization. Segmentation involves grouping customers with similar preferences and then targeting them in the same manner. If these segments capture the true (common) component of the preferences within the segment and eliminate random error through aggregation, the true component of the preferences is revealed. In extreme cases, such a "wisdom-of-the-crowd" effect (Surowiecki 2004) could yield a segment-specific product that generates even higher benefits for customers within the segment than products customized on the basis of erroneous individual preference statements. Kramer, Spolter-Weisfeld, and Thakkar (2007) provide evidence that there are indeed consumers who prefer products based on the aggregated preferences of other consumers over products based on their own preferences.

In summary, there are arguments against the core assumption of mass customization and individualization lit-

erature—namely, that products customized on the basis of the preferences expressed yield benefits for customers. Therefore, we formulate the following testable hypotheses:

H<sub>1</sub>: Products customized on the basis of measured preferences generate higher benefits for customers than (a) segment-specific products and (b) mass-marketing products.

H<sub>2</sub>: In a more general form, the closer the fit between measured preferences and product attributes, the higher is the resulting benefit for the customer.

### ***When Customized Products Create Benefits***

We cannot assume that there is a universal pattern in customer benefits from customization. Instead, the effect depends on specific conditional variables. Simonson (2005, p. 42) postulates that the “investigation [of responses to customized offers] must consider the moderating variables ... instead of just searching for main effects.” This is also supported by Von Hippel (2001, p. 255), who, in the context of the design interface of customization systems, states that “the design freedom provided by user toolkits for innovation may not be of interest to all or even to many users of a given type of product or service.”

The extant literature suggests preference insight as an important moderating variable. As we argued, the measurement of preferences (which is the basis for customization) can be effective only if consumers actually have well-defined preferences and are sufficiently aware of them (Kramer 2007; Simonson 2005). Kramer (2007, p. 231) argues that “the value of personalization may be limited when customers do not have stable preferences from which to derive customized offers.” If consumers do not really know what they want, they are more inclined to construct preferences based on situational cues when asked to specify product requirements, which brings about a high error term in their preference measurement. A product constructed on the basis of this measurement is of less value to the customer than when a customer has clear insight into his or her preferences. Furthermore, a customer with low preference insight might also be less able to evaluate whether an offering truly fits his or her preferences (Kramer 2007). Prior research has suggested that preference insight varies greatly among people (Bettman, Luce, and Payne 1998; Chernev, Mick, and Johnson 2003), and therefore we argue that this variable moderates the benefits obtained from customization.

H<sub>3</sub>: A customer’s preference insight has a positive effect on the benefit derived from customization.

A valid measurement of preferences requires not only that preference information actually exists on the customer side but also that the customer has the ability to reveal this information to the manufacturer. Polanyi’s (1983, p. 136) famous dictum, “we know more than we can tell,” points to the problem that this is not always an easy task. A wide body of literature has confirmed empirically that preference information on the customer side is often sticky and that people may have different abilities to express their preferences to an external institution (e.g., Aggarwal and Vaidyanathan 2003; Huber, Ariely, and Fischer 2002; Morrison, Roberts, and Von Hippel 2000; Von Hippel 1994; Von

Hippel and Katz 2002; West, Brown, and Hoch 1996). A person who has difficulty expressing his or her preferences creates a potentially high measurement error. Preference insight and the ability to express preferences might be positively correlated because both refer to the clarity of the preference system. However, these dimensions can also differ in many cases—for example, when a person’s verbal skills or skills in handling communication technology are particularly high or low (Aggarwal and Vaidyanathan 2003). Therefore, we postulate the following hypothesis:

H<sub>4</sub>: A customer’s ability to express his or her preferences has a positive effect on the benefit derived from customization.

Even if two people have an identical level of insight into their preferences and an identical ability to express them to the manufacturer, we argue that the benefit they derive from customization might still be different. People with high product involvement might put far more effort (in terms of time, ambition, and cognitive effort) into the product definition task than those with low involvement. Thus, the preferences they express might contain a smaller error term, which in turn results in higher benefits from customization. People with high product involvement might also respond more negatively (i.e., with higher disutility) if the product does not fit their preferences. In general, product involvement refers to the relevance of a specific product (category) as perceived by a customer based on his or her individual needs, preferences, and interests (Zaichkowsky 1985). Consumers with high product involvement tend to be portrayed as less willing to sacrifice than consumers with low product involvement (e.g., Baker and Lutz 2000). As Von Hippel (2005, p. 32) notes, “A serious mountain biker may be willing to simply buy any couch,... even if he or she is not fully happy with it. On the other hand, that same biker may be totally unwilling to compromise about getting mountain bike equipment that is precisely right for his or her specific needs.” Accordingly, research has found that consumers with high involvement in a product category carry out more comparisons between different offers to ensure the best preference fit (Gordon, McKeage, and Fox 1998). Kaplan, Schoder, and Haenlein (2007) show that the higher the consumption frequency of a certain product category (which should correlate with the consumer’s involvement level), the higher is the intention to adopt a customized product. Gordon, McKeage, and Fox (1998) also demonstrate that the relative effectiveness of customization is positively associated with product involvement. Thus, we formulate a testable hypothesis to describe this commonly held belief:

H<sub>5</sub>: Product involvement has a positive effect on the benefit derived from customization.

## **Study 1: Simulation of Customized Versus Standard Products in the Newspaper Market**

In Study 1, we tested our five hypotheses in the newspaper market. We chose this product category because it enabled us to employ concrete and relatively realistic experimental

stimuli—namely, newspapers that were actually tailored to the participants' preferences (with varying proximity). In addition, newspapers constitute a market in which customization is currently being discussed (Schoder et al. 2006) because of highly heterogeneous customer preferences.

The rationale underlying this study is simple: We simulate the three strategies of customization, segmentation, and mass marketing and measure the resulting benefits for customers. As a first step, we captured the participants' preferences with regard to a collection of 90 newspaper headlines. In the second step, we confronted participants with the experimental stimuli—namely, simulated “newspapers” that were each composed of a small selection of 10 headlines (taken from the 90 headlines) in random order. We then measured the benefits these newspapers generated for the participants (Figure 1).

### **Experimental Groups**

We structured the sample into ten subgroups to enhance the robustness of our findings. We first distinguish two independent samples (1 and 2). The difference between them is that the time between the first step (measurement of preferences) and the second step (measurement of reactions to stimuli) was ten days in Sample 1, whereas the second step immediately followed the first (using the same questionnaire) in Sample 2.

This process enabled us to analyze whether our findings are affected by participants' efforts to appear consistent in their response behavior (a form of “on-stage effect; see Podsakoff et al. 2003). Typically, participants tend to remember their preference statements for a limited time. In a pilot study with 25 participants, we had conducted a surprise recall test in which we asked participants to rate the 90 headlines according to their preferences, and ten days later, we confronted them with their responses, with changes in a random selection of 20 headline ratings. On average, participants were able to identify and correct only 24% of the modified ratings. Moreover, participants erroneously identified changes in 20% of the ratings that had not been modified. As we expected, this suggests that ten days can indeed provoke a substantial forgetting effect. If we find similar support for our hypotheses in Samples 1 and 2, we can surmise that the effects were not only due to an on-stage effect.

We subdivided both samples into five subsamples, each of which received different experimental stimuli. The participants in the two main samples were each randomly assigned to one of the following subsamples:

- Participants in Samples 1a and 2a each received an identical “mass-marketing newspaper” constructed on the basis of Sample 1's preferences (for a list of the stimuli, see the next section).
- Participants in Samples 1b and 2b each received the one “segment-specific newspaper” that came closest to their individual preferences and was taken from a five-segment solution.
- Participants in Samples 1c and 2c each received the one “segment-specific newspaper” that came closest to their individual preferences and was taken from a ten-segment solution.

- Participants in Samples 1d and 2d each received a “customized newspaper” that matched their individual preferences precisely.
- Participants in Samples 1e and 2e received all four of these stimuli in randomized order.

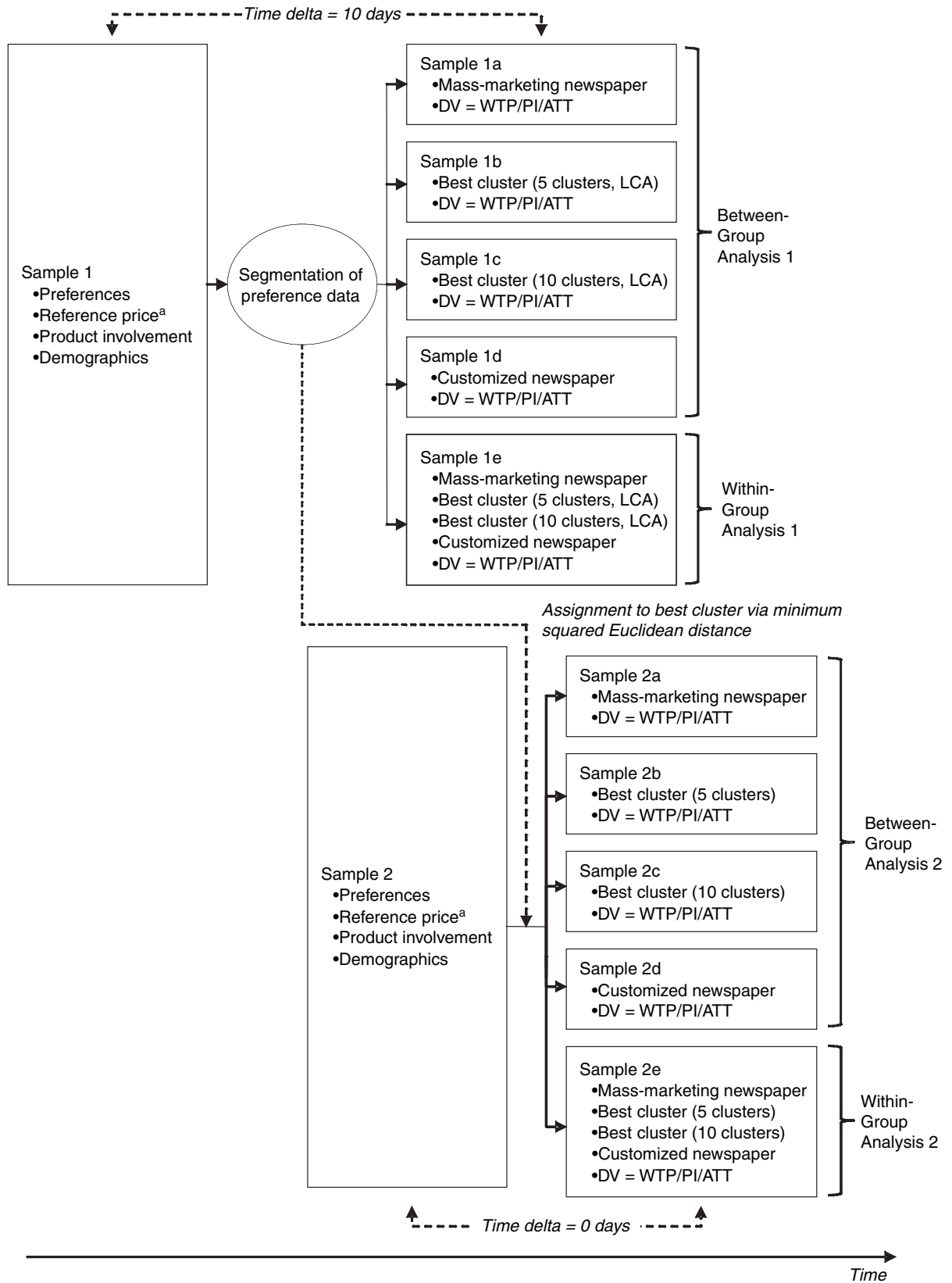
In all cases, the stimulus newspapers were introduced uniformly with the following sentences: “Here are newspapers consisting of 10 headlines each. If you compare this newspaper [stimulus newspaper] with the newspaper on the right side [the anchor stimulus—i.e., the expert newspaper; see next subsection], how do you like it?” We used between-subjects analyses in Samples 1a–1d and 2a–2d and within-subject analyses in Samples 1e–2e. Between-subjects and within-subject analyses each have their specific advantages and disadvantages (Maxwell and Delaney 2004); thus, we employed both to challenge the robustness of our findings. Overall, we employ a  $2 \times 2$  matrix of four independent tests (within-subject versus between-subjects design and short-time versus long-time delta between preference measurement and measurement of reaction to stimuli).

### **Experimental Stimuli**

We constructed the stimuli on the basis of the preferences expressed by participants in Sample 1. As a first step, we asked them to rate 90 different headlines on a five-point rating scale ranging from 1 (“I would really like to read this article”) to 5 (“I would definitely not read this article”). We selected these anchors in accordance with the recommendations of Kramer (2007), who notes that consumers understand their own preferences better if they are provided with a transparent elicitation task. In general, the headlines in our study included two introductory lines to give participants an idea of each article's subject.

The decision to use 90 headlines resulted from another pilot study we had conducted. We asked 45 randomly selected participants to read and rate a selection of headlines. One-third received 60 headlines, one-third 90 headlines, and one-third 120 headlines. Afterward, we conducted in-depth interviews to determine whether the respective tasks overstrained them and whether the elicitation task was clear and transparent. These interviews revealed that the maximum number participants could read completely and evaluate thoroughly was 90 headlines. In addition, it became clear that a multi-item measurement approach would require a much smaller number of headlines. As a result, we restricted the number of items to one per headline, which should yield information of the same validity as multiple-item measurement in this particular case of a clear question (Bergkvist and Rossiter 2007) and is less time consuming and strenuous for participants to complete (Gardner et al. 1998). The 90 headlines were randomly selected from the 4964 real articles released by the Austrian Press Agency in the period between March 24 and March 31, 2006. The articles were from the categories of foreign affairs, domestic affairs, current events, culture, economics, science, education, media, and sports. We used the preference information from Sample 1 to construct the different stimuli for Samples 1 and 2 (second step) as follows.

**FIGURE 1**  
**Data Collection Process (Study 1)**



<sup>a</sup>WTP for a newspaper assembled by experts.

Notes: DV = dependent variables, PI = purchase intention, ATT = attitude toward the product, and LCA = latent class cluster analysis.

*Mass-marketing newspaper.* We calculated the mean preference rating for each headline in Sample 1 and ranked the headlines on that basis. The ten best-rated headlines constitute our mass-marketing newspaper, the one standard product that comes closest to the participants' preferences.

*Segment-specific newspapers.* Using the preference ratings as a basis, we performed market segmentation using latent class analysis (Green, Carmone, and Wachpress 1976), which offers fundamental advantages over traditional types of cluster analysis (Vermunt and Magidson 2002; Wedel and Kamakura 2000). To determine the number of segments, we used the Bayesian information criterion to compare the models until model fit stopped improving (Schwarz 1978). Because 90 variables for segmentation would lead to negative degrees of freedom from 11 classes upward, we decided to conduct latent class analysis with a varied number of randomly chosen variables (20, 25, 30, 35, and 40). To account for the possibility of local optima, we replicated the estimation 50 times, each with a different set of randomly selected variables (similar to Kamakura and Wedel 1995). We found that the ten-segment model outperformed the other models; therefore, we used ten segments in our study (details on the Monte Carlo simulation are available on request). In addition, we calculated a five-segment solution because a meta-analysis of published market segmentation studies found that this is the mean number of segments used (Franke, Reisinger, and Hoppe 2009). The ten best-rated headlines in each segment defined the respective segment-specific newspapers—that is, the product that is best adapted to the average preferences of each segment. Participants in the subsamples who were confronted with a segment-specific newspaper (Samples 1b, 1c, 1e and 2b, 2c, 2e) received only the one segment-specific newspaper that came closest to their individual preferences. This assignment of participants was based on the classification results of the latent class analysis in Sample 1, while in Sample 2, we used the squared Euclidean distance between the participants' (individual) preferences and each segment-specific newspaper (calculated from Sample 1).

*Customized newspapers.* For each individual participant, we ranked the 90 headlines according to his or her preferences and took the ten highest-rated headlines. When equal scores precluded an exact solution (e.g., when 12 headlines were assigned a rating of 1), we randomly selected the headlines from those that were tied.

*Expert newspaper.* To ensure an identical point of reference for our between-subjects comparisons, we defined a standardized anchor. For this purpose, we provided all the subgroups with an identical newspaper that was to be rated by each participant before the stimulus newspaper (in terms of WTP). This newspaper again consisted of ten headlines and was developed on the basis of an expert evaluation. In a pilot study conducted before the experiment, we asked 23 experts (journalists from different Austrian newspapers and the Austrian Press Agency) to assess the attractiveness of the 90 headlines to newspaper readers (which also constituted the basis for the preference ratings of the participants in the experiment). They gave their assessment on a five-point rating scale ranging from 1 ("A typical Austrian news-

paper reader would really like to read this article") to 5 ("A typical Austrian newspaper reader would not be interested in this article at all"). We selected the ten headlines that received the best mean ratings to constitute the "expert newspaper."

## Measurement

In the first step, we measured the individual participants' WTP for the expert newspaper in addition to measuring their preferences. We also obtained data on the respondents' product involvement and demographics (age, sex, income, household size, and education) in this step. In the second step, we measured the individual participants' evaluative reaction to each particular stimulus (Samples 1a, 1b, 1c, 1d and 2a, 2b, 2c, 2d) and to all stimuli (Samples 1e and 2e). For this purpose, we measured the participants' WTP. The WTP or reservation price denotes the maximum amount of money a participant is willing to pay for a given product and thus constitutes a hard proxy to measure the benefit consumers (expect to) derive from that product (e.g., Homburg, Koschate, and Hoyer 2005; Voelckner 2006). To obtain additional indicators of consumer benefit, we also measured the participants' attitude toward the stimulus product and their purchase intentions. The expert newspaper was evaluated only in terms of the participants' WTP.

*WTP.* The literature proposes various methods of measuring WTP (Werthenbroch and Skiera 2002). In the case of the anchoring stimulus (the expert newspaper rated first by any participant), we employed a bracketing technique (Casey and Delquíé 1995) to enhance the validity of the ensuing stimulus ratings. We carried out a small pilot study ( $n = 30$ ) to check whether participants would accept the procedure, and the results were affirmative. Thus, we first asked participants to state their WTP for the expert newspaper. Depending on their responses, participants were given a higher follow-up price (their stated price plus €1.00) and asked whether they would also pay that sum. This step was repeated with €0.50 and then with €1, and ultimately the amount was doubled until the participants gave a negative answer. Finally, we provided participants with a scroll bar that enabled them to adjust their final WTP in the range between the last positive response and the ensuing negative response. We measured WTP for the stimulus newspapers (the mass-marketing newspaper, segment-specific newspaper, and customized newspaper) by providing the participants with a scroll bar ranging from €0.00 to €10.00, which constitutes a form of a contingent valuation method (Voelckner 2006). The (changeable) default value was the individual participant's WTP for the expert newspaper (the anchor). We carried out this elaborate procedure to obtain measures of WTP with maximum validity and on the basis of an identical reference point, but with a minimum of effort on the participants' part.

*Attitude toward the product.* We measured participants' attitude toward the product using three five-point semantic differential scales (the anchors were "like" versus "dislike," "good" versus "bad," and "appealing" versus "not appealing") adapted from the scale used by Schlosser and Shavitt

(2002). Reliability checks show a Cronbach's alpha of .94 across the two samples.

*Purchase intention.* We measured purchase intention using a Juster (1966) scale, an 11-point scale that measures individual purchase probability and has been shown to possess superior validity (Uncles and Lee 2006). To verify comprehensiveness and applicability for the purposes of this study, we carried out a small pilot experiment ( $n = 25$ ) with affirmative results. The three benefit measures are significantly correlated (WTP–purchase intention:  $r = .447$ ,  $p < .01$ ; WTP–attitude toward the product:  $r = .384$ ,  $p < .01$ ; purchase intention–attitude toward the product:  $r = .724$ ,  $p < .01$ ).

*Preference insight.* In this first study, we measured preference insight not by means of self-reports but on the basis of the participants' actual behavior. This delivered the clear advantage of not demanding extra effort from the participants because the questionnaire was relatively long. The large body of literature on measurement errors suggests that the less certain people feel when evaluating objects, the greater is their tendency to answer uniformly. Depending on the specific situation, this desire for uniformity can result in a systematic tendency to confirm (yea-saying), to deny (nay-saying), or to avoid extreme answers (central tendency) (see Pedhazur and Schmelkin 1991). Thus, we measured the respondents' insight using the squared variance of their preference statements regarding the 90 headlines. A pilot study ( $n = 29$ ) revealed that this measure and preference insight modeled as a latent construct based on the three items (used in Study 2) showed a high correlation ( $r = .623$ ,  $p < .01$ ), in support of the validity of this measurement.

*Ability to express preferences.* We also operationalized this latent construct in a relatively straightforward way to keep the questionnaire short. We built on the well-established finding in social sciences that there is a clear correlation between a person's level of education and ability to express him- or herself (see Pascarella and Terenzini 1991). Because the level of education is an ordinal measure, we used a dichotomous scale (1 = no college degree, and 2 = college degree or higher).

*Product involvement.* We confronted participants with the statement "For me, a newspaper (is) ..." and asked them to complete it using a reduced version of the personal involvement inventory scale (see Zaichkowsky 1985), which consists of six five-point semantic differential scales measuring the subjective importance of newspapers, anchored with "matters" versus "doesn't matter," "important" versus "unimportant," "useless" versus "useful," "boring" versus "interesting," "not needed" versus "needed," and "essential" versus "nonessential." The reliability of this construct was high, with a Cronbach's alpha of .93 across the two samples.

### Questionnaire and Samples

We obtained the data from self-administered online questionnaires. Two random samples were drawn from Austria's leading online panel (provided by MindTake New Media

Consulting), which is representative of Austrian residents with an e-mail account. For Sample 1, 7500 panel participants were contacted (with one reminder) and asked to fill out the first questionnaire (Step 1). Of these, 1213 participants answered this first questionnaire completely, for a response rate of 16.2%. Comparisons of early and late respondents showed no significant differences, which indicates the absence of response bias (Armstrong and Overton 1977). Ten days after the first questionnaire (and after we had carried out the segmentation analysis), the 1213 participants were contacted again and asked to fill out a second questionnaire (Step 2) with random assignments to experimental stimuli, for which the participants were divided into Subsamples 1a, 1b, 1c, 1d, and 1e. A total of 854 respondents from Step 1 agreed to participate, for a response rate of 70.4% in Step 2. Again, no response bias was visible. Along with Step 2 in Sample 1, another questionnaire was sent to the second (independent) sample of 4116 participants. The questionnaire for Sample 2 merged the two questionnaires from Sample 1 into a single questionnaire. Immediately after the participants stated their preferences regarding the 90 newspaper headlines, the respective stimulus was calculated. The assignment of participants to the various subsamples (Subsamples 2a, 2b, 2c, 2d, and 2e) was randomized by means of a database algorithm. The response rate was 17.9% (735 complete questionnaires with one reminder sent out). No response bias could be detected, and tests show no significant differences between the subsamples in Sample 1 and Sample 2.

### Findings

*Difference test.* As a first step, we compared the benefit generated by customized products with segment-specific and mass-marketing products (descriptive findings, such as which headlines attracted the most interest and which ones completely failed to do so, are available on request).

Table 1 shows the mean WTP, purchase intention, and attitude toward the product for the mass-marketing newspaper, the two segment-specific newspapers, and the customized newspaper for the between-subjects/within-subject analyses in Samples 1 and 2 and for the overall sample. We also provide the mean WTP for the expert newspaper. Tests for differences in means show a consistent and robust pattern in all four analyses.

We find that  $H_1$  gains clear support in any case. Regardless of whether it is compared with the two segment-specific newspapers or with the mass-marketing newspaper, the customized newspaper received significantly more favorable ratings with regard to WTP, purchase intention, and attitude toward the product. (As a notable side finding, we also discovered that the market experts were able to empathize with customers to some degree.)

*Dependency analysis.* We used pooled data for the dependency analysis.<sup>1</sup> Unlike Subsamples 1a–1d and 2a–2d, the data in Subsamples 1e and 2e are nested (for each

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<sup>1</sup>Patterns in subsamples are weaker because of the lower variance in the independent variable of preference fit. However, they are still visible.

**TABLE 1**  
**Mean WTP, Attitude Toward the Product (ATT), and Purchase Intention (PI) (Study 1)**

	Aggregated Analysis				Between-Subjects Analysis								Within-Subject Analysis							
	Total Sample				Sample 1				Sample 2				Sample 1				Sample 2			
	n <sup>a</sup>	WTP: M (SD)	ATT <sup>b</sup> : M (SD)	PI <sup>c</sup> : M (SD)	n	WTP: M (SD)	ATT <sup>b</sup> : M (SD)	PI <sup>c</sup> : M (SD)	n	WTP: M (SD)	ATT <sup>b</sup> : M (SD)	PI <sup>c</sup> : M (SD)	n	WTP: M (SD)	ATT <sup>b</sup> : M (SD)	PI <sup>c</sup> : M (SD)	n	WTP: M (SD)	ATT <sup>b</sup> : M (SD)	PI <sup>c</sup> : M (SD)
Expert product (1)	2522	.84 (.56)	—	—	692	.84 (.57)	—	—	586	.90 (.56)	—	—	162	.82 (.58)	—	—	149	.81 (.53)	—	—
Mass-marketing product (2)	633	.88 (.53)	2.73 (.97)	3.09 (.94)	170	.92 (.55)	2.48 (.91)	2.92 (.92)	152	.92 (.51)	2.79 (1.07)	3.14 (.98)	162	.84 (.53)	2.76 (.88)	3.14 (.92)	149	.83 (.52)	2.93 (.96)	3.18 (.92)
Segment-specific product assuming five segments (3)	628	.91 (.53)	2.61 (.91)	2.97 (.94)	171	.92 (.55)	2.55 (.96)	2.90 (.96)	146	.96 (.52)	2.69 (.88)	2.90 (.91)	162	.89 (.53)	2.52 (.90)	2.98 (.94)	149	.87 (.52)	2.70 (.93)	3.10 (.93)
Segment-specific product assuming ten segments (4)	623	.91 (.56)	2.66 (.92)	2.99 (.94)	171	.92 (.55)	2.56 (.83)	2.92 (.93)	141	.96 (.55)	2.69 (.99)	2.89 (.95)	162	.89 (.55)	2.60 (.90)	3.06 (.90)	149	.87 (.52)	2.82 (.95)	3.09 (.96)
Customized product (5)	638	1.00 (.57)	2.30 (.82)	2.66 (.85)	180	1.03 (.60)	2.19 (.69)	2.49 (.74)	147	1.07 (.62)	2.39 (.83)	2.68 (.86)	162	.95 (.54)	2.26 (.88)	2.75 (.91)	149	.96 (.53)	2.38 (.90)	2.77 (.89)
Δ(5) – (3) (H <sub>1a</sub> )		p < .01 <sup>d</sup>	p < .001 <sup>d</sup>	p < .001 <sup>d</sup>		p < .05 <sup>d</sup>	p < .001 <sup>e</sup>	p < .001 <sup>d</sup>		p < .05 <sup>d</sup>	p < .01 <sup>e</sup>	p < .05 <sup>d</sup>		p < .001 <sup>d</sup>	p < .01 <sup>d</sup>	p < .001 <sup>d</sup>		p < .001 <sup>d</sup>	p < .001 <sup>d</sup>	p < .001 <sup>d</sup>
Δ(5) – (4) (H <sub>1a</sub> )		p < .001 <sup>d</sup>	p < .001 <sup>d</sup>	p < .001 <sup>d</sup>		p < .05 <sup>d</sup>	p < .001 <sup>e</sup>	p < .001 <sup>d</sup>		p < .05 <sup>d</sup>	p < .05 <sup>e</sup>	p < .05 <sup>d</sup>		p < .01 <sup>d</sup>	p < .001 <sup>d</sup>	p < .001 <sup>d</sup>		p < .001 <sup>d</sup>	p < .001 <sup>d</sup>	p < .001 <sup>d</sup>
Δ(5) – (2) (H <sub>1b</sub> )		p < .001 <sup>d</sup>	p < .001 <sup>d</sup>	p < .001 <sup>d</sup>		p < .05 <sup>d</sup>	p < .01 <sup>e</sup>	p < .001 <sup>d</sup>		p < .01 <sup>d</sup>	p < .01 <sup>e</sup>	p < .001 <sup>d</sup>		p < .001 <sup>d</sup>	p < .001 <sup>d</sup>	p < .001 <sup>d</sup>		p < .001 <sup>d</sup>	p < .001 <sup>d</sup>	p < .001 <sup>d</sup>
Total		p < .001 <sup>f</sup> (F = 6.11)	p < .001 <sup>f</sup> (F = 28.19)	p < .001 <sup>f</sup> (F = 25.71)		n.s. <sup>f</sup>	p < .001 <sup>f</sup> (F = 7.61)	p < .001 <sup>f</sup> (F = 10.41)		n.s. <sup>f</sup>	p < .01 <sup>f</sup> (F = 4.94)	p < .001 <sup>f</sup> (F = 6.27)		p < .001 <sup>g</sup>	p < .001 <sup>h</sup>	p < .001 <sup>i</sup>		p < .001 <sup>j</sup>	p < .001 <sup>k</sup>	p < .001 <sup>l</sup>

<sup>a</sup>Total sample consists of 1278 participants from the between-subjects samples and 1244 participants from the within-subject samples (each participant in the within-subject sample counts for 4 data points).

<sup>b</sup>5-point rating scale (three items; 1 = "very high," and 5 = "very low").

<sup>c</sup>11-point probability scale transformed to a 5-point scale, in line with the work of Juster (1966) (1 = "very high," and 5 = "very low").

<sup>d</sup>Least significant difference test (one-sided).

<sup>e</sup>Dunnett T3 test (one-sided).

<sup>f</sup>Analysis of variance (ANOVA).

<sup>g</sup>Repeated measures ANOVA [F(2.57, 413.43) = 12.37].

<sup>h</sup>Repeated measures ANOVA [F(2.85, 458.17) = 16.79].

<sup>i</sup>Repeated measures ANOVA [F(3, 483) = 14.96].

<sup>j</sup>Repeated measures ANOVA [F(2.72, 402.58) = 22.48].

<sup>k</sup>Repeated measures ANOVA [F(3, 444) = 22.15].

<sup>l</sup>Repeated measures ANOVA [F(3, 444) = 18.86].



participant, we had four observations of preference fit), and therefore we randomly drew one observation for each participant. The ordinary least squares regression shows that the closer the fit between the preferences expressed and the product obtained (i.e., the higher the “extent of customization”), the higher is the benefits for customers, in support of  $H_2$  (see Table 2).

To test  $H_3$ – $H_5$ , we used moderated regression analysis (Cohen et al. 2003). We averaged involvement items to form an index (similar to Homburg and Fürst 2005) and standardized the predictor and moderator variables by mean centering (Frazier, Tix, and Barron 2004). We then created the product terms by multiplying the centered predictor and moderator variables (Aiken and West 1991).

In line with  $H_3$  and  $H_4$ , we find that preference insight and the ability to express preferences moderate the benefits participants derive from customization (i.e., a closer fit between preferences expressed and product characteristics obtained), regardless of whether the benefits are measured as WTP, purchase intention, or attitude toward the product (Table 2). Perhaps because preference insight and the ability to express preferences are significantly correlated ( $r = .07$ ,  $p < .001$ ), the effects diminish somewhat in the inclusive model. However, they are still visible. Only product involvement failed to show a significant moderator effect, which refutes  $H_5$ .

### **Discussion of Study 1**

We found that customization newspapers deliver clear benefits for a representative sample of customers because of improved preference fit. We also found that the benefits from customization are affected by the person’s insight into his or her own preferences and ability to express them. We failed to confirm the impact of product involvement. Thus, the question arises whether this is a general finding that requires an in-depth discussion of potential reasons or whether it results from the peculiarities of the method used or the market chosen. We offer a method-related explanation: Newspapers are a media product, and they essentially consist of information. When measuring product involvement, we asked participants about the relevance of the physical product—printed papers people peruse in the morning. In the other part of the experiment, we heavily emphasized the informational aspect of newspapers, operationalizing newspapers as a bundle of ten pieces of information (the headlines). Given the many ways information can be obtained—for example, on the Internet—it may well be that a person is highly interested in new information but at the same time reports a low level of involvement in (physical) newspapers. Therefore, we hypothesize that the lack of support for  $H_5$  in the newspaper market may be due to our operationalization. Our second study is intended to shed more light on this particular issue.

In general, the findings are based on four independent data sets (within-subject versus between-subjects design and short-time versus long-time delta between preference measurement and the measurement of reaction to stimuli). This constitutes a relatively rigorous analysis scheme, and we obtained almost identical patterns in the four settings,

thus providing robust support for our hypotheses on the benefits of customization.

The setting of our study required some simplifications. Our stimuli (the simulated newspapers) consisted of only 10 headlines taken from a set of 90. This appeared necessary to ensure that the task remained manageable for participants. In reality, most newspapers consist of approximately 100–300 articles, and the pool of possible news items is also considerably larger (e.g., the Austrian Press Agency releases approximately 600 articles, the German Press Agency releases approximately 800, the Associated Press releases approximately 20 million words of news per day). In addition, our stimuli did not include other content, such as advertisements, weather forecasts, or movie schedules, which might also be of value to consumers (Sonnac 2000). However, these simplifications lend our findings a conservative nature because there is little room for customization to exhibit its specific strengths within the heavily restricted setting of our study. Given heterogeneous preferences, participants can individualize only when there is a sufficiently large solution space. We conjecture that the benefits would be even more substantial if the experiment’s solution space came closer to real life.

Another aspect worth discussing is that we provided each participant in the subsamples with the optimum segment—that is, the segment that we knew came closest to his or her preferences (assuming these preferences did not change). Again, this is unrealistic because some assignments of customers to segments would be erroneous in real life. This can be regarded as a “subsidy” to the segmentation strategy and lends even more credibility to our finding that customized products generate higher benefits for customers than segment-specific products.

A research design such as ours involves the concrete risk of on-stage effects (Podsakoff et al. 2003). Participants were first asked about their level of interest in the 90 headlines; then, they were asked to evaluate simulated newspapers comprising selections of the headlines they had previously rated. It is possible that at least some participants were motivated by the desire to appear consistent and thus tried to adjust their evaluations to match their previous answers. We reduced this problem by making it impossible to return to the headline evaluations after they had been entered. Theoretically, participants could have kept some of their answers in mind. Therefore, we drew two samples with different periods between the measurement of preferences and the measurement of reactions to stimuli. If the desire to appear consistent played a role at all, the effects in Sample 2 should be clearer than in Sample 1. However, the patterns in the findings are nearly identical in both samples, suggesting that on-stage effects are unlikely to have affected our findings.

A more critical aspect of this study is the operationalization of “preference insight” and “ability to express preferences.” Although both variables can be considered latent constructs, we employed a relatively simple measurement. The length of the questionnaire precluded a more detailed operationalization. This raises questions regarding the extent to which the findings with regard to moderating effects hold when a different measurement is used.

**TABLE 2**  
**Moderated Multiple Regression Results (Study 1)**

	Model 1: Main Effects Only			Model 2: Main Effects and Interaction with Preference Insight			Model 3: Main Effects and Interaction with Ability to Express Preferences			Model 4: Main Effects and Interaction with Product Involvement			Model 5: Main Effects and All Interactions		
	Dependent Variables			Dependent Variables			Dependent Variables			Dependent Variables			Dependent Variables		
	WTP	ATT	PI	WTP	ATT	PI	WTP	ATT	PI	WTP	ATT	PI	WTP	ATT	PI
<b>Independent Variables</b>															
Preference fit	.131***	.202***	.207***	.109***	.171***	.187***	.128***	.200***	.202***	.129***	.203***	.206***	.109***	.171***	.187***
Preference insight	.011	.087**	.037*	.026	.108***	.051*	.007	.084**	.028	.012	.087**	.038†	.026	.108***	.051*
Ability to express preferences	-.026	.033†	-.024	-.026	.034†	-.023	-.026	.033†	-.023	-.025	.032	-.023	-.025	.007	-.023
Product involvement	.244***	.257***	.335***	.245***	.258***	.336***	.246***	.258***	.339***	.248***	.254***	.337***	.251***	.255***	.339***
<b>Control Variables</b>															
Age	-.076**	-.102***	-.088***	-.074**	-.099***	-.086***	-.077**	-.103***	-.089***	-.077**	-.101***	-.089***	-.075**	-.102***	-.086***
Sex	.063*	-.013	.038†	.064**	-.011	.039†	.061*	-.014	.035†	.064**	-.014	.038†	.065**	-.013	.040*
Household size	.049*	.024	.023	.048*	.024	.023	.048*	.024	.023	.051*	.023	.025	.050*	.024	.024
Income	-.011	.025	.081**	-.014	.021	.078**	-.008	.027	.086***	-.010	.025	.081**	-.013	.025	.079**
<b>Interactions</b>															
Preference fit × preference insight	—	—	—	.065*	.091**	.051*	—	—	—	—	—	—	.059*	.095***	.057*
Preference fit × ability to express preferences	—	—	—	—	—	—	.049*	.034†	.097***	—	—	—	.042†	.007	.035†
Preference fit × product involvement	—	—	—	—	—	—	—	—	—	.032	-.024	.017	.023	-.033	.008
R <sup>2</sup>	.082***	.108***	.160***	.085***	.114***	.163***	.082***	.109***	.169***	.083***	.109***	.161***	.088***	.115	.164***
ΔR <sup>2</sup>	—	—	—	.003*	.006**	.003*	.002*	.001†	.009***	.001	.001	.001	.006*	.007**	.004*

† $p < .1$  (one-sided).\* $p < .05$  (one-sided).\*\* $p < .01$  (one-sided).\*\*\* $p < .001$  (one-sided).Note: Standardized coefficients are shown;  $n = 1589$ ; ATT = attitude toward the product, and PI = purchase intention.

Moreover, the generalizability of our findings is a weak point in this study. Newspapers are frequently purchased, low-cost products with a large number of potential variants. They are hedonic (rather than utilitarian) products that are consumed in private (Knox and Walker 2001). The question arises whether our findings also hold for products that systematically differ from newspapers. Therefore, we conducted a second study to complement the results of Study 1.

## Study 2: Generalization Across Other Markets

The rationale underlying Study 2 is different from that of Study 1. We confronted each participant with two stimuli: a standard product in the relevant product category and a (simulated) customization configurator that would enable the participant to tailor the respective product to his or her specific preferences. Then, we measured the delta of benefit each participant associated with the two products and his or her resulting WTP as dependent variables. This means that a demand artifact (Sawyer 1975) might be present in Study 2; that is, participants might in part react to their interpretation of the experiment's purpose.<sup>2</sup> Unlike in Study 1, participants could be distracted from the purpose of the study only to a certain degree, and the design of the study does not allow for a time delta, which would provoke forgetting effects. We discuss the implications of the potential demand artifact in the "Methodological Limitations" section.

The independent variables measured subsequently were "preference insight," "ability to express preferences," and "product involvement," each of which we measured as a latent construct. The study was conducted independently in the product categories of fountain pens, kitchens, skis, and breakfast cereals. These products differ in terms of price level, hedonic value, and privacy of consumption. We also repeated the analysis in the newspaper category to determine the extent to which the different methods used in Studies 1 and 2 result in similar findings and in how far a different measurement of product involvement alters our findings with regard to H<sub>5</sub>.

### Experimental Stimuli

*Standard product.* In the case of newspapers, we defined the standard product in the same way as in Study 1; that is, we asked experts to determine headlines that were most appealing to newspaper readers from a new set of 90 randomly selected headlines. In the other product categories, we selected one standard market product from a set of five popular offerings that we collected with the help of market experts. The basis of the selection was a pilot study in which we asked 31 participants which of the five products they liked best. In general, the standard product was introduced with the lines "Here you see a [fountain pen] which fits the preferences and requirements of most consumers quite well" and described along the most relevant dimensions (Figure 2).

*Customized product.* For all the product categories, we simulated a mass customization toolkit that enabled participants to customize the product. We designed the toolkits so that participants could choose the most preferred parameter value for the product dimensions that were used to describe the standard product (Figure 2). The toolkit designs were based on a pilot study in which we thoroughly analyzed 53 existing mass customization toolkits on the Web and interviewed three market experts to make the design as realistic as possible. Participants were informed that the technical quality of the standard product and the customized product was identical.

### Measurement

*Preference insight.* The participants' degree of awareness of their own preferences regarding the specific product category was measured on the basis of extant literature (Kramer 2007; Simonson 2005). The items read "Regarding [fountain pens], I know exactly what I want"; "When I purchase a [fountain pen], I usually know quite soon what I prefer"; and "When I purchase a [fountain pen], I find it easy to choose among different alternatives" (1 = "high agreement," and 7 = "low agreement"; Cronbach's  $\alpha$  = .83).

*Ability to express preferences.* We measured this latent construct on the basis of relevant literature (Kramer 2007; Simonson 2005) and used the following items: "It would be easy for me to describe what an ideal [fountain pen] should look like"; "It would be no problem for me to name those attributes of a [fountain pen] which are most important to me"; "I could easily explain to someone else what kind of [fountain pen] I like best"; and "If I had three minutes' time to explain to someone else what I like and what I dislike, this person could theoretically choose a [fountain pen] for me that would meet my requirements" (1 = "high agreement," and 7 = "low agreement"; Cronbach's  $\alpha$  = .89).


*Product involvement.* We measured product involvement, with a new focus on involvement in news (instead of newspapers as a physical product), using a reduced version of Zaichkowsky's (1985) personal involvement inventory scale. To save space in the questionnaire, we selected three five-point semantic differential scales. The participants were asked to complete the short statement "For me, always having the latest news is...." The scales were anchored at "important" versus "unimportant," "useless" versus "useful," and "essential" versus "nonessential." A Cronbach's alpha of .87 across all samples (product categories) indicates a sufficient level of reliability in this construct. In addition, we measured participants' involvement in newspapers in the same way as in Study 1 ("For me, a newspaper is ..."), using the same three five-point semantic differential scales. Cronbach's alpha is .84, which points to high reliability in the measurement. The questions regarding involvement in news and newspapers were placed consecutively to make it more clear that the objects were different (see Oppenheim 2000). The two constructs are correlated (.52;  $p < .001$ ), which does not come as a surprise because newspapers are indeed bundles of news.

<sup>2</sup>We are indebted to one of the anonymous reviewers for pointing out this important issue.


FIGURE 2  
Presentation of Standard Product (Left) and Mass-Customization Configurator (Right) (e.g., Study 2)


Internet Explorer

Body:


Shape of body:  classic

Material: Shellac


Color: 


Shape of cap:  elliptic, with ornamentation

Clip and ornamentation:

Shape of clip:  straight

Material: Aluminium


Color of clip: 

Color of ornamentation: 


Engraving: (no)


Text: -

Color: -

Cap top:  Star

Material: Shellac


Color of cap top: 

Color of theme: 

Text: -



Font: -


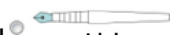
Nib size: 1.0 mm









Internet Explorer



Body:

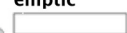
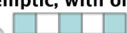
Shape of body:  straight  elliptic

 classic, horizontal ornamentation  pyramidal [\[100 more\]](#)




Material: ☐ Aluminium ☐ Carbon [\[15 more\]](#)  
☐ Mahogany ☐ Shellac

Color:       [\[20 more\]](#)







Shape of cap:  elliptic  elliptic, with ornamentation







 straight  straight, with ornamentation [\[100 more\]](#)

Clip and ornamentation:

Shape of clip:  straight  pyramidal  elliptic [\[100 more\]](#)







Material: ☐ Aluminium ☐ Carbon [\[15 more\]](#)  
☐ Mahogany ☐ Shellac




Color of clip:       [\[20 more\]](#)

Color of ornamentation:       [\[20 more\]](#)







Engraving:







Text:  Max 25 characters

Color:       [\[20 more\]](#)

Cap top:  Star  Sun  PK [\[75 more\]](#)

Material: ☐ Aluminium ☐ Carbon [\[15 more\]](#)  
☐ Mahogany ☐ Shellac

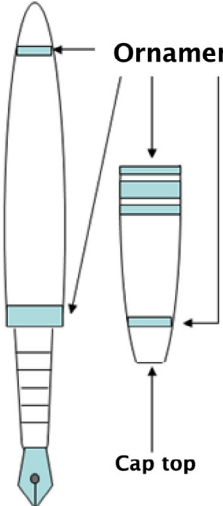
Color of cap top:       [\[20 more\]](#)

Color of theme:       [\[20 more\]](#)

Text:  Max 3 characters

Font: ☐ Times New Roman ☐ Arial ☐ Comic Sans [\[50 more\]](#)

Nib size: ☐ 0.5 mm ☐ 1.0 mm ☐ 1.5 mm ☐ 2.0 mm



*ΔBenefit.* We measured the additional benefit associated with a customized product (compared with the standard product) as a latent construct. We adapted the five items from Schreier (2006): “Compared to the standard [fountain pen], the customized [fountain pen] would ...” (1) “better satisfy my requirements,” (2) “better meet my personal preferences,” (3) “more likely be the best solution for me,” (4) “more likely be what I really want,” and (5) “more likely fit my image of a perfect [fountain pen].” We measured them on a seven-point scale (1 = “high agreement,” and 7 = “low agreement”; Cronbach’s  $\alpha = .96$ ).

To ascertain the validity of the four latent constructs, we employed exploratory factor analysis and confirmatory factor analysis. The former led to four extracted factors that together explained 79% of the overall variance, which points to the unidimensionality of the constructs. The latter delivered satisfactory overall fit statistics (goodness-of-fit index = .964, adjusted goodness-of-fit index = .949, comparative fit index = .982, incremental fit index = .982, and root mean square error of approximation = .048). All factor loadings were positive and significant, indicating a sound degree of convergent validity (detailed results of the confirmatory factor analysis are available from the authors on request).

*ΔWTP.* The second dependent variable was the intra-individual difference between WTP for the customized product and WTP for the standard product. In both cases, we measured WTP using the open-ended contingent valuation approach (“How much would you be willing to pay for [your self-designed] [fountain pen]?”) (Jones 1975). We then calculated the delta as WTP (customized product) less WTP (standard product).

### Questionnaire and Samples

As in Study 1, we obtained the data from self-administered online questionnaires. A random representative sample comprising 6775 participants was drawn from Austria’s leading online panel (provided by MindTake New Media Consulting), and they were contacted through e-mail, with an initial reminder after three days and a second reminder after seven days. Each member of the sample received a

questionnaire that was adapted to one of the five product categories and had been randomly assigned. A total of 1039 participants answered the questionnaire completely, for a response rate of 15.3%. Again, comparisons of early and late respondents showed no significant differences, indicating the absence of response bias (Armstrong and Overton 1977).

### Findings

*Difference test.* We first measured the extent to which the customized products provided higher benefits than standard products, as we conjectured in  $H_1$ . We reproduced the findings of Study 1 for the newspaper market ( $\Delta WTP = 36\%$ ,  $p < .001$ ) and found a stable pattern in the product categories of kitchens ( $\Delta WTP = 37\%$ ,  $p < .001$ ), fountain pens ( $\Delta WTP = 40\%$ ,  $p < .001$ ), skis ( $\Delta WTP = 34\%$ ,  $p < .001$ ), and breakfast cereals ( $\Delta WTP = 50\%$ ,  $p < .001$ ). Thus,  $H_1$  was confirmed in any case (see Table 3). Regardless of the product category, customization appears to increase the benefit a customer derives from a product, though the degree to which this increased differs between categories.

*Dependency analysis.* We used structural equation modeling to test  $H_2$ – $H_5$  (Figure 3) and tested the extent to which the constructs of “preference insight,” “ability to express preferences,” and “product involvement” affect the additional benefit participants derive from customization. We set the latent construct of  $\Delta Benefit$  as the first-order dependent variable and  $\Delta WTP$  as the second-order dependent variable. We then estimated six structural equation models (one for each product category and one overall model).

When first examining the results in the newspaper category, we again confirm the results of Study 1. In addition, when measured as latent constructs, preference insight and the ability to express preferences affect the benefits participants derive from customization. Product involvement has a significant impact, which, unlike Study 1, confirms  $H_5$ . In line with our conjecture, we find that if we take product involvement as measured in Study 1 (i.e., involvement in newspapers as a physical product), the path between product involvement and  $\Delta Benefit$  becomes insignificant (.037,  $p = .329$ ), while the other paths remain stable (preference

**TABLE 3**  
**Mean WTP for Standard and Customized Products (Study 2)**

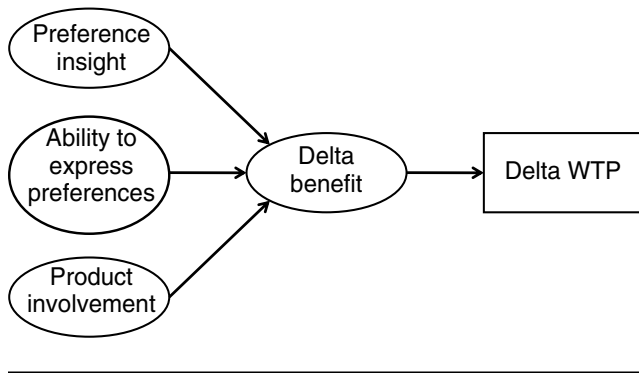
	Newspaper	Fountain Pen	Kitchen	Skis	Cereal	
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	
Mass-marketing product (1)	.75 (.52)	42.21 (27.54)	2481.80 (954.22)	211.82 (107.51)	2.11 (.84)	
Customized product (2)	1.02 (.66)	59.12 (39.57)	3406.76 (1369.04)	282.85 (147.67)	3.16 (1.08)	
% benefit gain	36%, $p < .001^a$ ( $t = -7.23$ )	40%, $p < .001^a$ ( $t = -10.25$ )	37%, $p < .001^a$ ( $t = -15.04$ )	34%, $p < .001^a$ ( $t = -11.72$ )	50%, $p < .001^a$ ( $t = -10.42$ )	$p < .05^b$ ( $F = 2.812$ )
N	231	200	198	201	209	

<sup>a</sup>t-test comparing WTP for the standard and customized product within each product category.

<sup>b</sup>ANOVA comparing the relative deltas in WTP across the product categories.

Notes: WTP for each product is reported in euros.

**FIGURE 3**  
**Structural Equation Model (Study 2)**



insight  $\rightarrow \Delta\text{Benefit} = .188, p < .05$ ; ability to express preferences  $\rightarrow \Delta\text{Benefit} = .217, p < .01$ ;  $\Delta\text{Benefit} \rightarrow \Delta\text{WTP} = .361, p < .01$ ). This suggests that the findings of Study 1 are indeed replicated and that our improved measurement of product involvement yields additional insights.

In the other product categories, the results of the structural equation models provide strong empirical support for our hypotheses. We find that the constructs of preference insight, ability to express preferences, and product involvement significantly affect the benefits from customization compared with standard products, thus confirming  $H_3$ – $H_5$ . We also find that these higher benefits result in higher WTP (see Table 4). In all product categories, alternative models performed worse. The model fit decreased significantly when paths were eliminated, suggesting that the pattern found is indeed robust across different product categories. However, although the identified patterns are similar in all product categories, we find substantial differences in effect sizes. Multigroup analyses show that the product category moderates the effects of preference insight, the ability to express preferences, and product involvement on the benefit a customer derives from a customized product. If the regression weights are held constant within our model, its overall fit decreases significantly.

### Discussion of Study 2

In Study 2, we successfully replicated the findings from Study 1 using a different method. This suggests that the patterns found are robust and valid. We also discovered that the findings are generalizable to other product categories, which differ greatly from newspapers. Compared with newspapers, fountain pens can be considered more hedonic, higher-priced products that are consumed more publicly and are not bought frequently. Skis also differ from newspapers in terms of their price, frequency of purchase, public consumption, and hedonic nature. Kitchens are high-priced products that are purchased seldom and involve an extensive decision-making process. Breakfast cereals may be regarded as different from newspapers because of their more utilitarian character. However, although we found similar patterns in the other product categories, both analy-

sis of variance in the case of WTP increases and multigroup analyses in the case of structural equation models show that the coefficients differ significantly. Thus, we cannot claim to have found a “natural constant.” In the context of our study, it would appear premature to speculate about why, for example, the WTP increase in the case of cereals is approximately 50% while the respective value fluctuates around 35% in the other product categories, because the differences can result from the product category and its various characteristics as well as the way we operationalized the toolkit. However, investigating reasons for the different levels might serve as a starting point for further research.

## General Discussion

### Theoretical Contribution

In our two studies, we found that products customized on the basis of measured customer preferences deliver clear benefits to the customer. This finding is highly relevant to the literature because it provides evidence of a critical relationship that, until now, has only been assumed and can be regarded as the foundation of management concepts, such as mass customization (e.g., Pine 1993; Wind and Mahajan 2001), one-to-one-marketing (e.g., Peppers and Rogers 1993, 1997), customer relationship management (e.g., Lemon, White, and Winer 2002), and personalization and smart agents (e.g., Alba et al. 1997). In our studies, we did not use a convenience sample of students, as in Franke and Piller (2004), Schreier (2006), or Franke and Schreier (2008, 2009), but rather a truly representative sample drawn from Austrian residents with an e-mail account (60% of Austrian residents have Internet access, and there is still a moderate bias toward younger, better-educated customers). The finding that the high benefit of customization is not merely a characteristic of one special-interest subgroup is a crucial aspect of our study.

The relatively large increase in derived benefit (despite identical technical quality) suggests that there is a great deal of “money on the table,” which underscores the high relevance of scholarly research on ways to reduce the costs of customization and indicates that such efforts are indeed highly promising. Cost reductions can come in various forms and comprise further improvements in flexible production technologies (e.g., Chua, Leong, and Lim 2003) and lower process costs for customers through design toolkits that are easier to use (Randall, Terwiesch, and Ulrich 2007) or through more effective recommender systems (Holzwarth, Janiszewski, and Neumann 2006). Given further progress, this suggests that individual marketing will indeed gain more importance relative to the traditional practices of segmentation and mass marketing, as several scholars have predicted.

However, we also show empirically that the benefits of customization are contingent on characteristics of the customer—namely, his or her level of insight into own preferences, ability to express those preferences, and product involvement (e.g., Kramer 2007; Simonson 2005). This challenges the tendency in the popular press to advocate customization as the best possible strategy for any con-

**TABLE 4**  
**Results from the Structural Equation Models (Study 2)**

	Newspaper		Fountain Pen		Kitchen		Skis		Cereal		Aggregated	
	Dependent Variable		Dependent Variable		Dependent Variable		Dependent Variable		Dependent Variable		Dependent Variable	
	ΔBenefit	ΔWTP	ΔBenefit	ΔWTP	ΔBenefit	ΔWTP	ΔBenefit	ΔWTP	ΔBenefit	ΔWTP	ΔBenefit	ΔWTP
Preference insight <sup>a</sup>	.175**	—	.331***	—	.193**	—	.213**	—	.178**	—	.123***	—
Ability to express preferences <sup>b</sup>	.192**	—	.194**	—	.184**	—	.294***	—	.258***	—	.289***	—
Product involvement <sup>c</sup>	.117*	—	.107*	—	.246***	—	.168**	—	.184***	—	.159***	—
ΔBenefit <sup>d</sup>	—	.360***	—	.332***	—	.254***	—	.393***	—	.283***	—	.162***
<b>Model Fit</b>												
$\chi^2$	145,321		161,061		134,399		170,966		190,995		321,525	
d.f.	98		98		98		98		98		98	
$\chi^2$ /d.f.	1483		1660		1371		1708		1949		3281	
GFI/AGFI	.929/.901		.908/.872		.924/.894		.904/.867		.901/.863		.962/.947	
IFI/CFI	.973/.973		.975/.974		.979/.979		.972/.972		.957/.957		.980/.980	
RMSEA	.046		.057		.043		.061		.068		.047	
N	231		200		198		201		209		1039	
<b>Rival Models</b>												
1. With fixed regression weights												
Δd.f.	—		—		—		—		—		60	
Δ $\chi^2$	—		—		—		—		—		+144.531***	
2. Without preference insight → ΔBenefit path												
Δd.f.	1		1		1		1		1		—	
Δ $\chi^2$	+3.51*		+7.59***		+3.80*		+3.37*		+3.31*		—	
3. Without ability to express preferences → ΔBenefit path												
Δd.f.	1		1		1		1		1		—	
Δ $\chi^2$	+4.48**		+3.20*		+2.99*		+9.06***		+6.95***		—	
4. Without product involvement → ΔBenefit path												
Δd.f.	1		1		1		1		1		—	
Δ $\chi^2$	+1.99		+2.16		+7.93***		+2.93*		+5.76**		—	

\* $p < .1$  (one-sided).

\*\* $p < .05$  (one-sided).

\*\*\* $p < .01$  (one-sided).

<sup>a</sup>Seven-point rating scale (three items: 1 = “agree completely,” and 7 = “disagree completely”).

<sup>b</sup>Seven-point rating scale (four items: 1 = “agree completely,” and 7 = “disagree completely”).

<sup>c</sup>Seven-point semantic differential scale following Zaichowsky (1985).

<sup>d</sup>Seven-point rating scale (five items: 1 = “agree completely,” and 7 = “disagree completely”).

Notes: Standardized coefficients are shown. GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, IFI = incremental fit index, CFI = comparative fit index, and RMSEA = root mean square error of approximation.

sumer in any situation. If customers have difficulties conveying preference information to the company (either because they are unaware of what they want or because they are not able to express their preferences properly) or if they have a low level of involvement, the benefits of customization will be considerably lower. This is in line with findings on user innovation activities (see Von Hippel 2005). The consistent finding is that a small subgroup of users (termed “lead users”) responds to the lack of products that fit their preferences by creating such a customized product themselves. These lead users are characterized by a clear and high demand for a solution to a problem they face (Von Hippel 1988).

Our finding that customization is particularly beneficial to customers with clear preference systems does not necessarily mean that customization strategies do not make sense in the opposite case. However, it indicates that customization processes should be designed differently. In our studies, we focused on a customer-active means of preference transmission in which customers must actively specify what they want. However, there are alternatives that require less skill and effort from the customer than laborious self-design processes, such as smart agents or recommender systems (which require little or no customer effort). The extent to which these systems provide benefits in such situations remains a question for further empirical research. In addition, it is important to bear in mind that interaction with a customization toolkit might actually help the consumer understand and articulate his or her preferences better because it involves trial-and-error learning with simulated feedback on the outcome (Von Hippel and Katz 2002). Research from Yoon and Simonson (2008), who find that the design of the configuration set affects the customers’ preference confidence and stability, can be viewed as a first step toward a better understanding of how customization might work when customers have no clear preferences. Again, additional research is necessary.

### ***Methodological Limitations and Avenues for Further Research***

Our studies only involved simulated products, which might lead to a “hypothetical bias,” particularly when participants reveal their WTP by means of the contingent valuation method (Wertenbroch and Skiera 2002). The relatively high sums participants claimed to be willing to pay for the products suggest that this effect also arose in our experiment. As a result, conclusions regarding the absolute amounts of money that can be skimmed through customization should be drawn with due caution. Additional research on this issue in a more realistic experimental setting is required. Fortunately, our study focuses on the relative level and not the absolute level of WTP. Several other studies have shown that inflation factors are stable across experimental groups (e.g., Franke and Piller 2004).

If we compare the WTP gains for customized newspapers in Studies 1 (14%) and 2 (35%), we find substantial differences, though both are based on a similar object (newspapers consisting of 10 articles chosen from a set of 90 headlines) and the populations were similar. The differ-

ence may be attributed to the presence of a demand artifact in Study 2 (Sawyer 1975). This means that participants might have in part reacted to their interpretation of the experiment’s purpose by making inflated statements of WTP. We do not know the extent of this effect; however, we found identical patterns in Studies 1 and 2 with regard to newspapers, both in the main effects and in the moderator variables, which provides evidence that the demand artifact does not explain the entire WTP gain observed in Study 2.

Does the inflation of WTP by the demand artifact in Study 2 affect the generalization that customization is also beneficial in other markets? We do not believe that this is the case. Assuming that (1) there is hardly any demand effect in Study 1 (here, the objectives of the experiments were unclear to participants—the study was entitled “What are newspaper readers interested in?”—and at least Sample 1 involved a ten-day time delta) and (2) the demand artifact in Study 2 had a similar inflating effect on all samples (which is likely because the samples were randomized and the setting was identical), we can “deflate” the WTP gain from customization in the categories of fountain pens, kitchens, and cereals by the same factor as in the newspaper category. Regardless of the concrete deflation algorithm (e.g., multiplicative or subtractive), the findings should still indicate a positive “true” gain in the other product categories.

We focused on the benefit component arising from increased preference fit. Although preference fit is considered the most important positive component in the customers’ “utility balance,” the process of self-designing a product might also carry value for customers (Franke and Schreier 2009). There may also be (positive) interaction effects between these components, which would warrant studies measuring both effects simultaneously. Further research also should integrate cost components (with varied methods of obtaining customized products, such as self-design toolkits or recommender systems) because they might also interact with the other components and yield more realistic insights into the net value of customization. All these components and their interplay might vary with product categories and cultural factors, which would explain why customization is common in some industries and nonexistent in others or why the commercial use of configuration toolkits differs in various countries (e.g., car configurators are more popular in Europe than in the United States).

In addition, the values attributed by consumers are not the only variables that determine whether customization is a viable business strategy in markets characterized by heterogeneous customer preferences. Other factors include network externalities of the products (which instead underscore the importance of standardization), experience effects, economies of scale, production and distribution costs, organizational issues (e.g., the “not-invented-here” syndrome), and the costs of organizational coordination. Further research from different perspectives is necessary to enhance the understanding of when customization constitutes a promising marketing strategy.



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