Customer Confusion Caused by Product Variety

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Abstract

Due to ever increasing product lines customer confusion becomes a serious problem for customers and companies alike. It can trigger unfavorable customer behavior leading to negative economic consequences for companies. Despite its importance literature on this topic is scarce. Analyzing experimental data of 1,128 consumers we demonstrate among others that an increasing product line size causes customer confusion. Furthermore, we found customer confusion being a mediator of the negative impact of product line size on purchase intention and word of mouth intention. Finally, we identified tools which reduce customer confusion. Our research has implications of utmost importance for research and practice.

Keywords: customer confusion, information overload, perception, post purchase, decision
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Introduction

In a competitive environment, the management of product portfolios is considered to be critically important (Hauser, Tellis, and Griffin, 2006). Often, companies try to face this environment by extending their product lines (Hoch, Bradlow, and Wansink, 1999). However, research has questioned the advantages of extended product offering for customers and companies alike (Gourville and Soman, 2005). Large product lines seem to overload customers with information and make it more difficult for them to identify their preferred product (Fasolo et al., 2009).

In this context, customer confusion can occur. This is considered an emotional state which makes it difficult for customers to select and comprehend alternatives (Walsh, Hennig-Thurau, and Mitchell, 2007). It is the consequence of information overload (e.g., Leek and Chansawatkit, 2006) and it can trigger unfavorable customer behavior such as purchase abandonment leading to negative economic consequences for companies (e.g., Mitchell and Papavassiliou, 1999).

Despite its importance literature on this topic is scarce (Haynes, 2009). Furthermore, research systematically analyzing negative post-purchase consequences of customer confusion, such as the customers’ word of mouth intention regarding the product line is still lacking (Mitchell, Walsh, and Yamin, 2005). Therefore, in the present study we will investigate the emergence of customer confusion and its most important consequences for companies. More specifically, we intend to study purchase intention and word of mouth intention. Additionally, we will test a management tool that should help companies to reduce customer confusion.

Theoretical Underpinning and Conceptual Development

Information overload is seen as the main reason for customer confusion (e.g., Mitchell and Papavassiliou, 1999). Basic assumptions of the information overload paradigm are humans’ limited information processing capacities (Malhotra, 1982). If an individual’s information processing capacity is exceeded a cognitive overload occurs; the individual faces an information overload (e.g., Malhotra, Jain, and Lagakos, 1982). This can lead to confusion, suboptimal decision making, and therefore, to dysfunctional performance (Malhotra, 1982).

Products mostly contain plenty of information relevant for a customer’s purchase decision (e.g., packaging, brand name, ingredients, etc.). If the number of products in a product line increases, the amount of information increases as well. Therefore, the information carried by a large product line can exceed the customer’s information processing capacity. Consequently, information overload can occur and trigger customer confusion. Therefore, we propose:

\[ H_1: \] The larger a company’s product line the stronger the customer confusion.

Product complexity in terms of the present study is associated with the number of product attributes relevant for the customer within the evaluation process (Burnham, Frels, and Mahajan, 2003). Therefore, if the product complexity is high, that is the product can be described on many attributes, the amount of information carried by each product is large. Consequently, the probability that information overload and, therefore, customer confusion occurs, is higher than in purchase situations characterized by a low product complexity. Furthermore, the difference between the amount of information to process in high product complexity versus low product complexity situations increases with increasing product line size. Hence, we posit:

\[ H_{2a}: \] The higher the complexity of the products the stronger the customer confusion.

\[ H_{2b}: \] The effect between the size of a company’s product line and customer confusion will be moderated by the complexity of the products within the product line.

Iyengar and Lepper (2000) and later Sethi-Iyengar, Huberman, and Jiang (2004) found that individuals are less likely to choose an option if confronted with a larger – as opposed to a
smaller – set of alternatives. They explain this with the intrinsic motivation to choose which decreases with increasing choices available. An increasing level of regret can be considered as a further explanation for these findings (Haynes, 2009). With an increasing number of choice options available the probability that there is more than one option which meets the needs of a customer increases as well (White and Hoffrage, 2009). Often this results in an uncertainty about the best alternative to choose (Haynes, 2009). To avoid regret at a later point of time resulting from a potentially suboptimal choice customers may even decide not to choose an option at all (Zeelenberg and Pieters, 2004). Therefore, we posit that:

**H3a**: The larger a company’s product line, the lower the customers’ purchase intention.

Environmental psychology emphasizes that individuals adapt their behavior to the environment they are confronted with (e.g., Saegert and Winkel, 1990). The Mehrabian-Russel model, which is frequently used in consumer research (e.g., Dawson, Bloch, and Ridgway, 1990), further elaborates the issue of adaption (Mehrabian and Russell, 1974). The model proposes a two-step process of customer behavior. As a first step, exogenous (i.e., environmental stimuli as perceived by individuals) and endogenous factors (i.e., personality traits) cause a positive or negative primary emotional reaction of an individual. Subsequently, a positive emotional reaction leads to an approach behavior and a negative reaction to an avoidance behavior, expressing itself in the extent of the individual’s willingness to act or communicate (Donovan et al., 1994). The primary emotional reaction is mainly expressed in the model by the emotional states of pleasure, displeasure, arousal, and non arousal. It is hypothesized that arousal is positively related to approach behavior in pleasant environments but positively related to avoidance behavior in unpleasant environments (Donovan et al., 1994; Mehrabian and Russell, 1974).

If customers feel confusion due to a large product line, it is likely that they perceive the environment as unpleasant. Therefore, an increasing arousal, which is caused by a higher amount of environmental stimuli (e.g., alternative of a product line) will increase the probability of avoidance behavior in this unpleasant environment. This can lead, for example, to purchase abandonment (Donovan and Rossiter, 1982). Furthermore, stimulus load theory posits that individuals will try to regain an acceptable level of stimulation if their information processing capacity is surpassed (Veitch and Arkkelin, 1995). Therefore, we hypothesize:

**H3b**: The effect between the size of a company’s product line and customers’ purchase intention will be mediated by customer confusion.

In addition to several reduction strategies within the purchase situation customer confusion can result in further post-purchase reactions, which may have negative long-term consequences for companies. According to the attribution theory this can occur if customers attribute their confusion to company-related sources (Mitchell, Walsh, and Yamin, 2005). We consider the impact on customers’ word of mouth intention regarding the product line of the company as one of the most critical consequences of customer confusion as it affects the company’s relationships to many actual or potential customers. Referring to the Mehrabian-Russel model, an increasing arousal in an unpleasant environment leads to an avoidance behavior which can manifest itself in many different ways such as a decreasing positive word of mouth intention. In line with this, some studies in psychology have shown that negative emotions (e.g., anger, sadness, disappointment) in a purchase or an evaluation situation reduce positive word of mouth intention (Derbaix and Vanhamme, 2003; Nyer, 1997). Hence, we postulate:

**H4**: The effect between the size of a company’s product line and customers’ word of mouth intention will be mediated by customer confusion.

Following the adaption level theory the maximum information processing capacity is also depending on the specific adaption level of the individual (Helson, 1964; Veitch and Arkkelin, 1995). Hence for example expert buyers can often process more information, in this context, product alternatives, due to their increased knowledge about their product-related preferences (Huffman and Houston, 1993; Huffman and Kahn, 1998). Therefore, learning preferences regarding the attribute values of a product category or even a specific product line could be an
An effective way of reducing customer confusion. One approach of imparting customers this knowledge before or within a purchase situation is presenting them relevant product information in the form of a consumption vocabulary. A consumption vocabulary is defined as any framework that allows customers to identify product attributes and to evaluate their values (Hoch and Deighton, 1989). Previous research showed that customers provided with an attribute-based consumption vocabulary before the choice decision perceived the complexity of the choice set as significantly lower than those who were not (Huffman and Kahn, 1998). Moreover, they developed comparatively better defined and more stable preferences regarding the possible attribute values (West, Brown, and Hoch, 1996). This will result in a reduction of the cognitive effort during the purchase situation (West, Brown, and Hoch, 1996) and, therefore, reduces customer confusion. Due to the increasing cognitive effort associated with a choice decision from an increasing number of product alternatives the described effect of the consumption vocabulary will be higher if the customer faces a large product line. Therefore, we propose:

**H5a**: Customers will exhibit less customer confusion if a consumption vocabulary is provided to them before and during the purchase situation.

**H5b**: The effect between the size of a company’s product line and customer confusion will be moderated by the provision of a consumption vocabulary.

Our hypotheses are depicted in our conceptual model in Figure 1.

![Conceptual Model](image-url)

**Figure 1: Conceptual Model**

**Methodology and Data**

In order to investigate the phenomenon of customer confusion we conducted an online experiment. The stimuli consisted of various jam product lines. Similar stimuli have been successfully used in previous research in order to examine the influence of product variety on customer behavior (e.g., Iyengar and Lepper, 2000). To ensure that the majority of the test persons did not have firmly established preferences regarding a jam alternative, which could simplify choice, the most popular flavors (strawberry, raspberry, apricot, and cherry) were excluded from the product lines (Chernev, 2003; Iyengar and Lepper, 2000).

The product line in our study was manipulated by varying the number of products in the product line and the complexity of these products. To determine the size categories we first reviewed the literature regarding experiments associated with product variety. Secondly, we analyzed the results of a conducted pilot study (n=50) in which students had to indicate how many jars of jam they regard to be in a small, a medium and a large product line (small: 5.5; medium: 12.2; large: 26.8). Thirdly, we conducted 20 store-checks. Based on this we chose the sizes of 6, 12 and 27 products to be suitable to represent the different sizes of product lines.

The degree of product complexity in this context was modeled by using the number of attributes which describe the products in the purchase situation (Burnham, Frels, and Mahajan, 2003). The jams in the conditions with a high product complexity were described by six attributes which we
identified in 10 expert interviews as being the most important: flavor (10 different flavors), sugar content (40 g sugar/100 g; 60 g sugar/100 g), fruit pieces (yes; no), fruit content (50%; 75%), natural aroma (yes; no), and packaging (jar; container). In the conditions with a low product complexity only the first three attributes were used.

We also manipulated the level of information about the product line provided to the customers. Half of the respondents were presented with an attribute-based consumption vocabulary which showed all product attributes and their corresponding possible values before the actual purchase decision, whereas the other customers obtained no assistance (West, Brown, and Hoch, 1996).

To test the hypotheses, a 3 (size of the product line: 6 products, 12 products, 27 products) x 2 (product complexity: low, high) x 2 (provision of a consumption vocabulary: yes, no) between-subject design was chosen. The main experiment was conducted with 1,128 members of an online panel (52.0% were female; average age was 39.5 years). Participants were randomly assigned to one of the twelve experimental conditions. This procedure resulted in equal sized groups (n = 94). After a short introduction, subjects were asked to read the described scenario carefully. Following this, the participants in the experimental conditions with additional attribute information were provided with the consumption vocabulary table. Subsequently, all participants were asked to inspect the jam product line visually and to choose the most preferred jam alternative. In the following participants were asked to fill out the questionnaire which ended with the manipulation checks. Finally, participants who wanted to take part in a lottery had to indicate whether they wished to obtain either one of 20 breakfast sets consisting of 2 jars of jam of the flavor they chose in the experiment or 5€ in cash in case of a win.

All latent constructs were assessed by using adapted multi-items measured on a seven-point Likert scale. Moreover, the purchase intention was additionally measured by mean of the percentage of participants who decided in favor of the breakfast sets in the course of the lottery. Reliability measures revealed very good results for all constructs, since Cronbach’s alphas ranged from .943 for customer confusion to .971 for word of mouth intention. The average variance extracted (AVE) for each factor exceeded .70, indicating that the measures are internally consistent (Fornell and Larcker, 1981). The composite reliability measures are all greater than .950. We also find support for convergence validity because the t-values for all constructs are significant at p < .01 (Gerbing and Anderson, 1988).

Data Analysis and Results

Manipulation checks with regard to product line size, product complexity, and customers’ information level showed that all our manipulations were successful. To test our hypothesis regarding the impact of the product line size on customer confusion (H1), at first, we conducted a one-way analysis of variances (ANOVA) followed by a Tukey post hoc test. We detected significant differences in the level of customer confusion between each of the product line size categories (M₆=2.17, M₁₂=3.21, M₂₇=4.16; F (2, 1125)=191.762, p<.01), indicating that an increasing product line size leads to an increasing level of customer confusion.

We analyzed all direct and moderating effects with partial least squares (PLS) structural equation modeling. PLS, as a component-based method, allows the use of nominal data, which we need to assess the effects emanating from product complexity and consumption vocabulary. Furthermore, it simplifies modeling complex models as it is required in this study. Therefore, PLS is applied in experimental research in addition to analysis of variance (e.g., Hennig-Thurau et al., 2006). To estimate the model paths, we used PLS Graph 3.0. The inner weightings are estimated with the path method (Chin, 2001). T-statistics and standard errors are estimated by mean of the bootstrapping procedure with a resample size of 200 (Chin, 1998).

The PLS results also showed that product line size had a significant positive effect on customer confusion (B=.486; t=21.530; p<.01). Furthermore, the effects of product line size on purchase intention (B =-.157, t =5.331; p<.01) (H₃a), and word of mouth intention (B=−.110; t=3.615;
p<.01) (not hypothesized but additionally tested relationship) were significantly negative. In line with this, our additional measure for purchase intention, the percentage of chosen breakfast sets in the course of the lottery, was higher in the small product line conditions (62%) than in the medium (54%) and the large product line conditions (48%). Additionally, customer confusion had a significantly negative impact on purchase intention (B = -.318; t= 9.738; p<.01) and word of mouth intention (B = -.232; t= 6.915; p<.01). Once customer confusion enters the structural equation model the previous direct effects of product line size on purchase intention and word of mouth intention become insignificant (purchase intention: B = .002; t= .048; p>.10/ word of mouth intention: B = .003; t= .093; p>.10). Hence, we found empirical evidence that customer confusion is totally mediating the impact of product line size on purchase intention respectively word of mouth intention. Therefore, we found support for H3b, H4.

To analyze the proposed moderating effects we followed the PLS product indicator approach for measuring interaction effects proposed by Chin, Marcolin, and Newsted (2003). In doing so, we found a significant moderating effect of product complexity (B = .046; t= 1.722; p<.05) (H2b). We also found a significant direct effect of product complexity on customer confusion (B = .106; t= 4.356; p<.01) (H2a). Furthermore, the moderating effect of consumption vocabulary on the impact of product line size on customer confusion was significantly negative (B = -.056; t= 2.215; p<.05) (H5b). Moreover, also the direct effect of consumption vocabulary on customer confusion was significantly negative (B = -.070; t= 2.657; p<.01) (H5a).

**Discussion, Implications for Product Line Management, and Future Research**

We found that customer confusion increases with the number and the complexity of products in a product line. The moderating effect of product complexity indicates that the confusion causing effect of product line size increases with product complexity. Thus, the problem of customer confusion is especially evident for companies offering large, highly complex product lines. Furthermore, we identified customer confusion to totally mediate the negative effects of product line size on purchase intention and positive word of mouth intention. Therefore, a large product line does not necessarily cause lower levels of these variables itself. Only in those cases, where customers were suffering from confusion, purchase intention and word of mouth intention were affected negatively.

Finally, we have identified a consumption vocabulary, containing the most important product attributes and their possible values, to be an instrument to reduce customer confusion. Additionally, the moderating effect of the consumption vocabulary indicates that the effectiveness of this tool was highest if customers were confronted with the largest product line.

Our findings have important implications for product line management. First, managers have to be aware of the fact, that large product offerings potentially cause customer confusion. However, if customer confusion occurs, product line managers have to take measures to reduce it. In this regard a reduction of the product line size seems to be reasonable. The present study showed on the one hand a decrease in customer confusion, and on the other hand an increase in customers’ purchase intention and their positive word of mouth intention with decreasing product line size.

Finally, measures within the purchase situation helping customers to obtain a suitable level of product information as well as to learn their individual product attribute related preferences should be pursued by product line managers (Walsh, Hennig-Thurau, and Mitchell, 2007). An attribute-based presentation of product information which could for example be placed on the packaging of the products seems to be suitable in this context (West, Brown, and Hoch, 1996). Certainly this study points out avenues for future research. As one limitation of our study is the restriction to the product category of jams, future research could enhance the generalizability of our results by investigating other product categories.
References


