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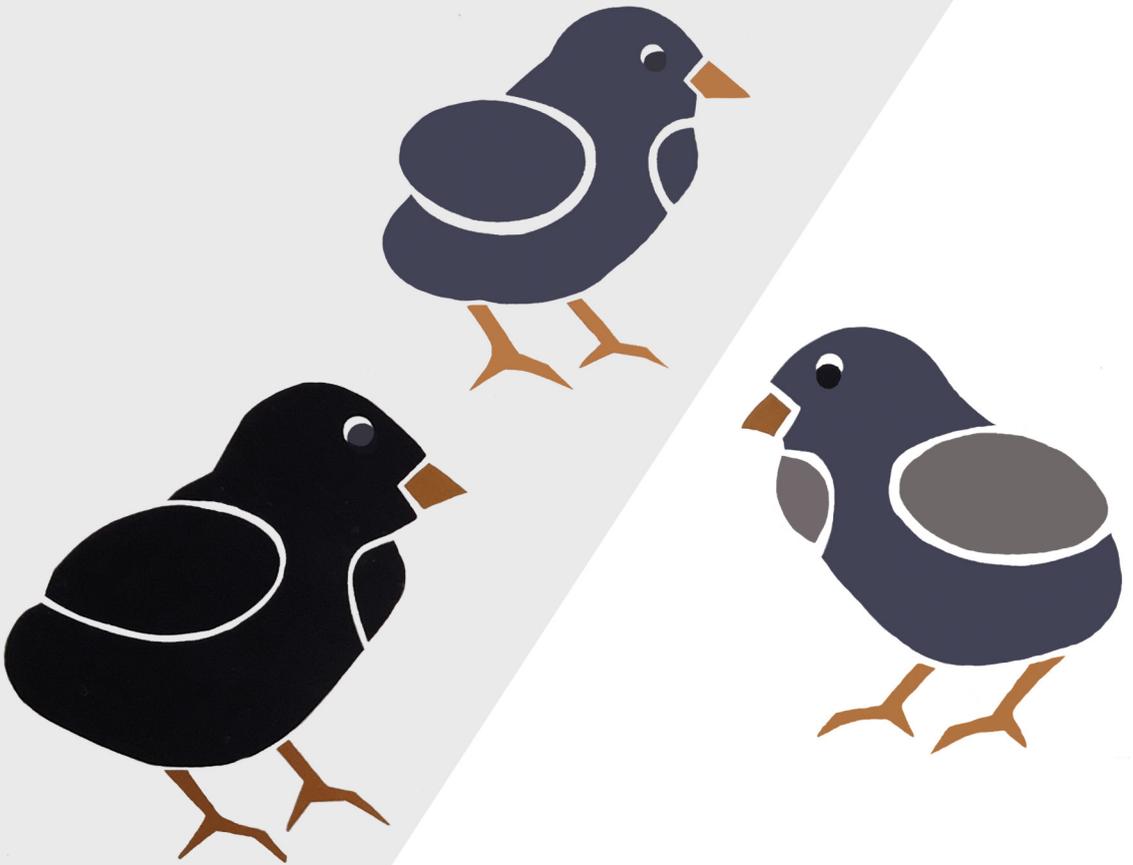
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Undecidable? Categorization and its effects



Bram Kuijken

UNDECIDABLE?
CATEGORIZATION AND ITS EFFECTS

Bram Kuijken

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UNDECIDABLE? CATEGORIZATION AND ITS EFFECTS

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Chapter 1

INTRODUCTION

Occasionally, groups of tourists or security guards are seen riding a two-wheeled, self-balancing, electric vehicle. This, at the time radically innovative, vehicle, named the Segway, was introduced in 2001. It was hyped-up by the media who proclaimed that this strange vehicle would change transportation. Furthermore, one of the primary investors in the Segway, John Doerr, made a bold statement that “it would become more important than the internet”. The Segway, however, failed to meet these expectations. The product found users in niche segments, such as guided tours and law enforcement, but it did not reach the mass market. There are several possible reasons for the failure of the Segway; an important one is that this self-balancing, two-wheeled electric vehicle did not clearly fit into an existing category of transportation modes (Sørensen, 2013).

The Segway combines elements from a walking scooter, (electric) bicycle, and a unicycle. The challenge of clearly categorizing the Segway influenced policy makers, who found it challenging to determine the traffic rules for the Segway. Likewise, consumers had a difficult time categorizing and determining the value of this new method of transportation. It is possible that the Segway was ahead of its time, but after it was introduced it was rejected by the mass market. This is a common problem with innovative products that cannot be clearly categorized into an existing category or that can be categorized in multiple categories. The core theme of this thesis is about the effects of categorization in the case of products or producers that cannot be easily categorized because they are new and/or because they can be categorized in multiple categories.

Categorization is the process of identifying the similarities among alternatives within a category and identifying the dissimilarities among alternatives across categories (Medin and Schaeffer 1978; Rosch and Mervis 1975). To do this, consumers refer to their knowledge of existing product categories (Gregan-Paxton, and John, 1997; Moreau, Lehmann, and Markman, 2001). Through this knowledge, consumers compare products to alternatives in existing categories, which helps them to understand the products and determine their value (Talke et al., 2009; Rindova and Petkova, 2007; Moreau et al., 2001). Categorization can have a particularly strong impact on the market performance of new products. The more innovative a product is, the larger the risk is that consumers will not be able to clearly categorize the product; this might have negative consequences on the market performance of the product.

Indeed, previous research demonstrates that consumers' evaluations of products that cannot be easily categorized can be negatively affected (e.g., Hsu, 2006; Negro and Leung, 2013; Noseworthy and Trudel, 2011). The Segway is one of the many examples of products that are being valued lower because they cannot be easily categorized.

In order to overcome the potential negative effects of an unclear categorical identity of new products, producers can provide category cues to guide consumers in their categorization efforts. Both visual and textual elements can be seen as category cues and can strongly influence how the market will categorize their products. First, scholars argued that the visual appearance of a product is important to how it is categorized (Bloch, 1995; Creusen and Schoormans, 2005; Eisenman, 2013; Goode, Dahl, and Moreau, 2013; Mugge and Dahl, 2013; Radford and Bloch, 2011; Rindova and Petkova, 2007). Producers can signal the category membership of their products by deliberately applying or not applying typical visual design elements to them. For example, washing machines are often white, clothes for boys are generally not pink, and wine normally comes in a glass bottle and milk in a carton (currently in the Netherlands). Regarding new products, which often combine elements from multiple categories, producers can choose between cues from multiple categories. For example, the Segway combines elements from a walking scooter, (electric) bicycle, and a unicycle. Perhaps the Segway would have been accepted by the mass market if it looked more like a regular bicycle.

Next to visual design elements, producers can use textual cues to communicate the category membership of the product. For example, textual cues can be descriptions of the product or the label of the category. Category labels can provide guidance to consumers in their categorization efforts as they judge the value of a product (Mogilner, Rudnick, and Iyengar, 2008). Labels represent a set of characteristics of a category and they are used by market actors to name and identify products and producers (Navis and Glynn, 2010). Through labels, people can efficiently communicate about categories. It would be time consuming to state "that thing used for transportation, with two wheels, pedals, a steering wheel, and a saddle", when referring to a bicycle. During the early stages of the emergence of a category the number of category labels that are introduced and used often increases rapidly (Grodal, Gotsopoulos, and Suarez, 2014). This provides challenges for producers in terms of the decision about which category label they

should provide to guide consumers in their categorization efforts during the market introduction of their new products.

The main objective of this thesis is to obtain a better understanding of categorization and its effects in cases where consumers or other market actors are undecided about the categorical membership of a product or producer. To obtain a better understanding, this thesis builds on literature in the fields of marketing and organization, which are complementary to each other. Most of the studies in marketing that explore the effects of categorization use consumers as the unit of analysis to investigate how consumers categorize products that are difficult to categorize (e.g. Gregan-Paxton, Hoeffler and Zhao, 2005; Moreau et al., 2001; Noseworthy and Goode, 2011) and the degree to which this affects their evaluation of the product (e.g., Meyers-Levy and Tybout, 1989; Noseworthy and Trudel, 2011; Noseworthy, Di Muro, and Murray, 2014). In most of these studies only a few different products are used. This makes it difficult to account for the competitive context, and to generalize the findings at an industry level.

Studies in organization theory also explore the effects of categorization and tend to use products, producers, or other market actors as the unit of analysis (e.g. Hsu, 2006; Negro and Leung, 2013; Pontikes, 2012; Ruef and Patterson, 2009; Zuckerman, 1999), which makes it possible to measure the effects of categorization at an industry level. However, most of those studies do not directly measure consumer behavior in terms of evaluation and categorization of the product or producer (Bowers, 2014). For example, they use performance indicators such as sales figures, expert ratings, and reviews to measure how the product or producer is categorized and they use third party sources such as databases (e.g. IMDB for movie genres). The problem with these measures is that they are assumed to represent the behavior and perceptions of consumers (Bowers, 2014). This thesis combines and builds on insight from both streams (marketing and organization theory) and builds the foundation for a bridge that could – at least partly – close the gap between these two streams.

1.1 Main theoretical themes

The insight from studies in organization theory and marketing literature on categorization in four themes are structured as discussed in this

section. The themes are related to the effects of categorization in cases where products or producers are difficult to categorize. The four themes were chosen because they are addressed by scholars in organization theory and marketing literature, and because these themes combine insight into the most recent studies on categorization. The first theme provides insight into the effects of products or producers that combine multiple categories on how those products are categorized and valued. The second theme discusses the lack of consensus that different market actors might have about the categorical membership of a product or producer. The third theme argues that categories are socially constructed and that categories are not fixed elements in a market or industry, but that they evolve and change over time. Finally, the fourth theme deals with how producers communicate the category membership of themselves and their products.

1.1.1 Theme 1: The effects of spanning categories

The first theme of this thesis relates to the effects of spanning categories. Category spanning occurs when a product or producer is concurrently a member of two or more categories that belong to the same classification system (Vergne and Wry, 2014). For example, contrary to ‘pen-scissors’ (i.e. a combination of a pen and a scissors, both are stationary products) a yellow laptop does not span similar hierarchical categories. However, a yellow printer-laptop (i.e. a yellow laptop that can also print) does span similar hierarchical categories. A common notion within studies on organization theory is that products or producers receive less positive evaluations when they span multiple categories (Hsu, 2006; Leung and Sharkey, 2013). Scholars also showed that the effects of spanning categories might be less negative in some situations and more severe in others. For example, the negative effects of category spanning are stronger when the contrast (i.e. the degree to which a category has sharp boundaries) of the categories that are being spanned is high (Kovács and Hannan, 2010).

In addition, some market actors might be less deterred or even attracted to category spanning. For example, venture capitalists prefer startups that belong to multiple categories because they tend to be more flexible and can establish new markets (Pontikes, 2012). Category spanning also has a positive effect on receiving an investment for science startups that incorporate features from a technology category,

but not the other way around (Wry, Lounsbury, and Jennings, 2014). In other words, the effect of category spanning depends on the category that producers 'start in' (Wry et al., 2014). Finally, in cases where the categories are emerging and the classification systems are not fully developed, producers who span multiple categories do not seem to be negatively evaluated (Ruef and Patterson, 2009).

Most studies on category spanning in organization theory use the product, the producer, or another market actor as unit of analysis, and they tend to use indirect measures for the evaluation and perception of the unit of analysis. An exception is a recent study by Bowers (2014), who took an initial step towards measuring the direct evaluation of equity analysts to demonstrate the positive effects of a clear category membership and the negative effects of belonging to multiple categories. According to Bowers (2014) the evaluation of market actors for the same producer or product can differ, which is important to consider.

In marketing studies on categorization, it is common practice to examine the effects of categorization by directly measuring the categorization and evaluation of products in the eyes of market actors (mostly consumers). Studies in marketing demonstrate that consumers tend to use a single category to make sense of products that combine elements from multiple categories, which is referred to as the 'single category belief problem' (Moreau et al., 2001; Noseworthy, Wang, Islam, 2012; Rajagopal and Burnkrant, 2009). It may not be a desired situation if consumers only use one category to make sense of products that combine elements from multiple categories, because they might not perceive all of the associated benefits. In addition, consumers might understand category spanning products faster if they can use information from multiple categories that they are familiar with (Moreau et al., 2001).

Similar to studies in organization theory, studies in marketing demonstrate that category spanning does not necessarily have a negative effect on all cases. For example, consumers can use two categories to make sense of a product when the number of cues per category is limited (Moreau et al., 2001), or when both categories are communicated at the same time (Gregan-Paxton et al., 2005). In addition, Noseworthy et al., (2012) demonstrated that the competitive context, in terms of the products that are being compared by consumers, influences how consumers classify category spanning product. Their study is the first in the field of marketing to investigate the effects of categorization

and demonstrate the importance of the competitive context. Interestingly, among studies on organization theory it is common to account for the competitive context, since those studies use the product or producer as the unit of analyses.

Spanning categories does not always have negative effects on performance. This partly depends on the categories that are spanned, how they are spanned, and the signals that producers send to reveal the category membership of themselves or their products. It also depends on the competitive position of the producer and the competitive context in which it operates. Two of the four core chapters of this thesis cover this theme. First, Chapter 2 describes a specific hybrid product that combines product and service elements into product-service systems (PSS). An increasing number of producers develop and offer bundles of product and service elements. However, many producers struggle with developing and marketing effective PSS' that enhance performance (Baveja, Gilbert, and Ledingham, 2004; Neely, 2008; Stanley and Wojcik, 2005; Ulaga and Reinartz, 2011). PSS' combine a product and a service category, which may be confusing for consumers and negatively affect their evaluation (Hsu, 2006; Leung and Sharkey, 2013; Noseworthy and Trudel, 2011). In Chapter 2, a framework is proposed that can be used to identify and develop effective PSS'.

A second study that deals with category spanning – as reported in Chapter 3 – examines producers' decisions about the design of a product that combines functionalities from multiple categories. The decision to combine functionalities from multiple categories into called hybrid product can arise due to a market opportunity (such as the current trend of combining product and service elements into PSS'). Combining functionalities of multiple categories provides producers the freedom – and the challenge – to choose from multiple category specific design characteristics. The strategic design decisions that producers make will determine whether the hybrid product will look more or less like one particular category, like all categories, or like neither category. In addition, the extent to which the competitive position of the producer and how the competitive context in which it operates affects their strategic design decisions when developing hybrid products are discussed.

1.1.2 Theme 2: Category consensus

The second theme of this thesis is about the similarity in category perceptions between and among different market actors, also referred to as category consensus. In organizational literature, category consensus is conceptualized as the degree to which market actors have a similar perception about the categorical membership of a product or producer (Zuckerman, 2004). Categories have high consensus when the sets of characteristics largely overlap in the perceptions of the market actors (Hannan, Pólos, and Carroll, 2007). Hsu (2006) demonstrated that greater consensus among market actors led to higher box office movie sales. In addition, she found that category consensus had a positive moderating effect on the negative effect of category spanning. In other words, products or producers that span multiple categories face less or even no negative effects if market actors agree on the categorical membership of a product or producer.

In marketing literature, the concept of category consensus has not received significant attention. However, marketing scholars demonstrate that consumers can differ in their perception or attitude towards products or producers, which can also affect the manner in which they categorize the same product or producer. For example, marketing scholars found that consumers differ in their tendency to buy new products more often and earlier than others (Goldsmith, Freiden, and Eastman, 1995; Goldsmith, Hauteville, and Flynn, 1998; Midgley and Dowling, 1978). In addition, consumers also differ in their knowledge of categories (Bettman and Sujana, 1987). Therefore, as consumers have different degrees of knowledge of a category, differ in their degree of innovativeness and given that categories are sense-making devices (Murphy, 2002; Ross, 1996); different consumers might use different categories to make sense of the same product. Moreover, this might occur often when product categories are emerging. During the early stages of category emergence, the boundaries are less clear and multiple category labels are used (Grodal et al., 2014); this increases the risk of a lack of consensus among – for example – consumers.

Although studies in organization theory have demonstrated different effects of categorization on different types of market actors (e.g. Pontikes, 2012; Kim and Jensen, 2011), these studies did not consider that different types of market actors might categorize the same object differently. In addition, studies in marketing have not focused on the effects of a lack of consensus between different types of market

actors. However, Rosa et al. (1999) argued that producers and consumers – being different types of market actors – have different frames of references (e.g. a production versus a consumption frame) and different knowledge structures, and they operate in different contexts. Consequently, these different types of market actors could also have different categorical perceptions. Hsu (2006) has taken a step in the direction of studying the effects of consensus by considering the possibility that different market actors categorize the same object differently. However, she only considered category consensus among the same type of market actors and not between different types of market actors (for example producers versus consumers). Although both ‘types’ of consensus – within and between types of market actors – might have an effect on market performance, the latter has not received attention in organization theory or marketing literature.

In summary, this theme argues that there can be a lack of consensus about the categorical membership of the same product, as perceived by different market actors. This can occur within one type of market actor (e.g. consumers) and among different types of market actors (e.g. consumers versus producers). As the latter has not received much attention one study (reported in Chapter 5) was devoted to examining the effect of a lack of consensus between producers and consumers about the categorical membership of the same product. We argue that this difference in classification between producers and consumers – the classification gap – about the same products has a negative effect on the performance of those products.

1.1.3 Theme 3: Dynamic character of categories

A third theme of this thesis deals with the dynamic character of categories. Categories are not fixed elements in a market or industry; they are socially constructed and they evolve and change over time (Rosa et al., 1999). Scholars in the field of organization theory have extensively studied how categories emerge (Grodal et al., 2014; Navis and Glynn, 2010; Santos and Eisenhardt, 2009) and how this affects the market performance of producers and their products (Alexy and George, 2013; Kennedy, 2008; Khaire and Wadhvani, 2010). This topic has received much less attention among marketing scholars. One exception in marketing literature is the study by Rosa et al. (1999) – which is widely cited by organization theory scholars – who demonstrate that

categories emerge through interaction between producers and consumers.

The emergence of a new category is often triggered by the introduction of radically innovative products (Garcia and Calantone, 2002; Rindova and Petkova, 2007; Veryzer, 1998). In general, emerging categories tend to follow a few stages in their process of becoming mature (Abernathy and Utterback, 1978; Grodal et al., 2014). In the early stages of the emergence of new categories, there is low or even no agreement on the core attributes of the categories (Grodal et al., 2014). The following three types of category attributes play a role during the emergence of new categories. First, within emerging categories there is no dominant design, in terms of technological features (Srinivasan, Lilien, and Rangaswamy, 2006; Utterback and Suarez, 1993). When there is no dominant design the core technological functionalities of the products within a category substantially differ across the products in that category (Utterback and Suarez, 1993).

Second, during the first stages of the emergence of a category many new category labels are introduced by different market actors who try to make sense of the new products (Grodal et al., 2014). It is mainly producers that introduce new category labels, because they often come into contact with new products much sooner than consumers (Grodal et al., 2014). However, the category label that turns out to be 'the one' often emerges from interaction between actors from both sides of the market (i.e. production and consumption) (Grodal et al., 2014; Rosa et al., 1999).

Third, the alternatives in an emerging category tend to look dissimilar in terms of visual appearance (Eisenman, 2013). New products and their new technological features and functionalities also need an 'embodiment'. Since the features and functionalities greatly differ during the early stages of the emergence of a category, the embodiment can also differ to a large extent. Once the category is further emerging, typical visual design elements also emerge (Eisenman, 2013). Although the emergence of a category is influenced by the interaction between actors from the production and consumption sides of the market, producers' decisions that are related to all three of the discussed category attributes (technological features, category labels, visual appearance) affect how consumers categorize and evaluate the producers and their products. In addition, these decisions can strongly influence the emergence of a category.

Organization theory scholars argue that the effects of categorization differ depending on the emergence of the category (Ruef

and Patterson, 2009; Negro, Hannan, and Rao, 2010; Kovács, and Hannan, 2010). For example, when categories and classification systems are not yet mature, producers who span multiple categories are not negatively evaluated (Ruef and Patterson, 2009). The opposite is true for cases in which producers span categories with high contrast (Kovács, and Hannan, 2010). In addition, introducing a new product in an emerging category might be beneficial, since consumers expect new products due to the innovative character of that product category (Wood and Moreau, 2006).

Two core chapters of this thesis focus on the effects of the degree to which a category is emerging on the decisions of producers and on the performance of the products within those categories. Chapter 3 discusses whether or not producers make different design decisions depending on the degree of emergence of a category, when they combine elements from multiple categories into a hybrid product. It is argued that producers are less likely to use any category specific design characteristics from these categories for the hybrid product.

Chapter 4 examines the effect of providing category labels on consumers' willingness to pay and their newness perceptions. Providing category labels – for example, when advertising new products – can guide consumers in categorizing and evaluating new products (Yamauchi and Markman, 2000). When a category is emerging, multiple category labels might be in use for the same product category (Grodal et al., 2014). This provides producers with the challenging task of choosing the 'right' category label when they advertise their product. The effect of providing category labels that represent categories that differ in their degree of matureness on consumers' newness perceptions and willingness to pay is studied. It is expected that consumers' newness perceptions of radically innovative products would increase when labels refer them to an emerging category, compared to a mature category. In addition, as consumers tend to value newness (Bloch, 1995; Hirschman, 1980; Moreau and Dahl, 2005), it is expected that their willingness to pay for radically innovative products would increase when labels refer them to an emerging category, compared to a mature category.

1.1.4 Theme 4: Communicating category membership

The final theme of this thesis deals with how producers communicate the category membership of themselves and their products. Scholars in

organization theory studied how producers communicate their category membership by making claims about their organizational identity. According to Whetten and Mackey (2002), an “organizational identity is appropriately conceived of as a set of categorical identity claims (who or what we claim to be, categorically) in reference to a specified set of institutionally standardized social categories” (p. 397). For example, producers can claim categorical identity by mentioning category labels in press releases (Pontikes, 2012). Organizational identities are formed by the claims that are made by internal actors towards each other and towards external actors (Gioia et al., 2010; Ravasi and Schultz, 2006; Scott and Lane, 2000). By sending out those claims producers try to create a consistent and targeted representation of themselves (Elsbach and Kramer, 1996; Lamertz, Heugens, and Calmet, 2005). In addition, producers may establish category membership through claims of similarity or dissimilarity compared to competitors (Porac and Thomas, 1990; Porac, Thomas, and Baden-Fuller, 1989).

Next to communicating category membership at an organization level, producers also communicate the category membership of their products. Studies in marketing and organization theory have discussed several types – both visual and textual – of cues that can affect categorization and evaluation (Bloch, 1995; Eisenman, 2013; Creusen and Schoormans, 2005; Goode, Dahl, and Moreau, 2013; Mugge and Dahl, 2013; Radford and Bloch, 2011; Rindova and Petkova, 2007). Since producers make decisions about which (technological) features and functionalities to combine in their new products, they also need to make decisions about the visual appearance of the products and the textual elements that they provide when they advertise or communicate the products. Category cues – both visual and textual – are especially useful when it is not directly obvious how the product can be categorized, which is often the case with a new product. In those cases, category cues can help consumers make sense of the product.

Producers can signal their own category membership and that of their products by deliberately providing – or deliberately not providing – visual and textual category cues. Category cues provide guidance to consumers in their categorization efforts by helping them decide which alternatives the product should be compared to in order to understand and judge the value of the product (Mogilner et al., 2008). However, it is not always straight forward which category cues a producer should use, or what the determinants are of producers’ decisions regarding their choice to use certain category cues. Therefore, two core chapters in this

thesis aim to gain more insight regarding the communication of a product's categorical membership. Chapter 3 examines the determinants of producers' decisions regarding the use of certain typical design characteristics, such as color, shape, texture, and symbols. In this chapter the concept of category markers is introduced to refer to those typical design characteristics with a primary function of conveying a product's categorical identity. This chapter focuses on the influence of the competitive position (in terms of the producer's market share of a product in a particular category) and competitive context (in terms of the degree of emergence of the category) of producers on their decisions to use category markers when designing new hybrid products.

Chapter 4 aims to gain a better understanding of the effects of providing category labels. Category labels can provide guidance to consumers in their categorization efforts by helping them to decide which alternatives the product should be compared to in order to understand and judge the value of the product (Mogilner et al., 2008). Specifically, the effects of providing category labels that differ in their degree of maturity on consumers' newness perceptions and willingness to pay for a radically innovative product are studied. This chapter argues that consumers' willingness to pay for a radically innovative product increases when a category label is provided from an emerging category, due to perceived newness. However, a fit between the degree of maturity between the provided label and the degree to which the product is innovative is important.

1.2 Empirical context: Innovative products

This PhD project was part of CRISP (Creative Industry Scientific Programme), which focused on generating knowledge about how to design and develop effective product service systems (PSS), which are – often innovative – combinations of product and service elements. As PSS' combine elements from multiple categories (i.e. a product and a service category), this thesis focuses on categorization in general, and not solely on PSS'. Specifically, it focuses on the effects of categorization in the case of innovative products.

Products that are innovative and new to the market are, by definition, different from existing products, but the degree of newness can differ. In addition, the extent to which a new product can be easily categorized can differ. For example, a new product could be easily

categorized but still be perceived as a new alternative in an existing category. This type of products refers to incremental innovation. On the other hand, radically innovative products are the starting point for new product categories because they cannot be categorized into existing ones (Garcia and Calantone, 2002; Rindova and Petkova, 2007; Veryzer, 1998). The effects of categorization seem to be particularly interesting in the case of innovative products.

In the four core studies described in this thesis incrementally and radically innovative products were examined. Two of the four studies (partly) focus on PSS' that are new to the market (Chapters 2 and 3). One of those studies provides and empirically tests, a framework to clearly identify innovative PSS' (Chapter 2), and the second study examines how producers decide on the categorical identity of the innovative PSS – among other innovative hybrids – that they develop (Chapter 3). The third core study examines, by conducting three experiments, the effects of using category labels on consumers' evaluations of incrementally and radically innovative products (Chapter 4). In the final core study (Chapter 5) we measure the degree to which producers and consumers categorize music festivals differently, and measure the effect of this 'classification gap' on product performance. Most festivals are recurring yearly events that tend to offer a new lineup each year, which increases the risk of a classification gap.

1.3 Methodology

In this thesis three methods of data collection were used, including surveys, structured interviews, and experimental auctions. In two of the four studies surveys were used. As described in Chapter 2, in which a framework for clearly identifying a PSS is provided, a survey was used to empirically test ideas among 84 product and service developers. Chapter 5 measures – using surveys – how producers and consumers categorize the same festival in terms of musical genres. In total, the genre classification of 70 festivals was measured. In addition, 1554 potential visitors of music festivals in the Netherlands were surveyed about their awareness of the festivals, and whether or not they considered visiting or had visited the festivals.

In the study described in Chapter 3 structured interviews were conducted with 71 product and service designers. They were queried about their decisions to use category markers in a range of possible

contextual scenarios in which they were asked to combine elements from two categories. During new product development, designers often decide – or at least strongly influence – what the product will look like in terms of shapes, color, or graphic elements; thus, they consciously or unconsciously also make decisions about the use of category markers. The different scenarios varied in terms of a) the degree of emergence of the categories that they were asked to combine, b) whether or not they had a large market share in the categories, and c) the type of products that they were asked to combine.

The third method of data collection consisted of online experimental auctions. Online experimental auctions were conducted in two of the four studies (see Chapters 2 and 4). The online research platform, which we developed ourselves, combines a sealed bid *n*th price auction with a short survey tool. The platform works as follows; respondents place one sealed bid that others cannot see and subsequently they answer a few questions. The respondents are randomly assigned to one of a number of advertisements. This allows us to measure differences in willingness to pay depending on the advertisement. The winners of the auction actually pay for and receive the product. The winners of the auction are the highest bidders, but they pay an amount that is equal to a bid that is lower than their own bid. The amount that the winners pay is approximately 20% below the normal retail price. The reason for this is to make the auction more comparable with real purchase situations for bidders. Since respondents know that the auctions are real and that they will pay less than their own bid if they win the auction, they have an incentive to truthfully bid their maximum willingness to pay.

A consumer panel of 1800 ‘active’ respondents was recruited (i.e. respondents who participated in at least one auction every 30 days). When conducting an experiment, respondents are invited by email and they place their bids in a field below the advertisement. After confirming their bids they are asked to complete the survey questions. After closing the auction, the respondents will receive an email with the outcome of the auction. In the email to the winner, his or her own bid amount and the amount that he or she has to pay is mentioned, and the payment details are provided. The respondents who do not win the auction will receive an email in which their own bid amount and the amount that the winner has to pay are mentioned.

This self-developed auction platform provides an efficient and valid way to conduct experiments that measure the effect of

communicating a product in a particular way on consumers' willingness to pay. This not only proved to be an efficient method of gathering reliable data for these studies; this tool was also useful for students, other researchers, and producers. I will continue using this tool – although under a new name (www.alleeup.com) – for my own academic research and to assist startups with: a) testing what consumers are willing to pay for their new products, b) finding out who is willing to pay the most, and c) determining how to effectively communicate their new products.

Chapter 2

EFFECTIVE PRODUCT-SERVICE SYSTEMS

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Abstract

Producers increasingly offer bundles of products and services in product-service systems (PSS). However, literature on PSS' is limited and a lack of consensus about how a PSS should be understood makes it difficult to develop a PSS that generates competitive benefits in a systematic fashion. The primary purpose of this paper is to propose a new framework that defines products, services, and PSS from the perspective of how these offerings create value for the customer, and to show how this framework can contribute to the development of competitively effective PSS'. The framework builds on the core idea that products and services differ from each other with regard to the value that is created by the tangibility or non-tangibility and the interactions or non-interactions between producers and customers; this is presented in a 2x2 matrix. Subsequently, principles that are important for identifying and developing effective PSS' are proposed. Those principles include that the product and service elements of the PSS should have sufficient autonomous value to be sold separately on the market, they should come from different quadrants of the 2x2 matrix, and the combination of product and service elements should create synergy. Through a survey, our ideas were empirically tested among product and service developers. In addition, through an experiment that used a sealed bid second price auction, how to effectively position a PSS in the market was tested. This paper concludes with a discussion.

2.1 Introduction

Increasingly, producers develop and market product-service systems (PSS) to gain a competitive advantage (e.g. Antioco et al., 2008; Manzini and Vezzoli, 2003). PSS' involve offerings that include one or more product functionality and one or more associated service functionality. While a new firm can decide to offer PSS' from the start, the usual path towards such an offering is that a firm that already offers either products or services adds the missing component to its offerings. Service providers can choose to offer PSS' by adding products to existing services ('productization'). For them, this bundling of products and services can be beneficial because it can result in, among other things, more efficiency (reduction of costs). For example, direct, personal contact with customers is (partly) replaced by (intelligent) products, such as robots to assist care providers.

Another benefit is that by integrating a product and service into a PSS, it is possible to make a service more tangible and easier to understand and evaluate before a purchase (Jaakkola, 2011). However, the opposite movement, adding services to products or "servitization" is much more common and has received much more attention from researchers (see especially Neely, 2008; 2010). The PSS concept has, in general, been discussed in terms of the manufacturing industry that shifts its business focus from designing and selling physical products only, to designing and selling a system of products and services (e.g., Manzini and Vezzoli, 2003; Santamaria, Nieto, and Miles, 2012; Ulaga and Reinartz, 2011; Vandermerwe and Rada, 1988).

For example, to profit from the rapid growth of the 3D printing market, some manufacturers of printing machines are exploring ways to offer 3D printing 'on demand' services to, for example, designers and artists. For manufacturers, bundling of products and services is advantageous because services tend to lock the customer into a long-term relationship (Cohen, Agrawal, and Agrawal, 2006; Tukker, 2004; Vandermerwe and Rada, 1988). PSS' either provide a means to lower costs, for either the PSS providers or their customers (Ulaga and Reinartz, 2011), or a means to differentiate similar offerings and increase the (perceived) added value of these offerings (Gebauer and Friedli, 2005; Penttinen and Palmer, 2007). PSS` can bring products closer to the customer and enable customization and tailor made solutions to a larger extent than traditional products. PSS` can thus create a more personalized experience.

As Neely (2008) notes, servitization concerns manufacturers in the developed world who add services to products that would otherwise be offered at other positions in the value system, usually further downstream. They would be offered by either specialized service providers, such as repair firms; by retailers; or by other manufacturers who use the original product in their products and add the service to the composite resulting product. One example of this is a firm that produces cooling fans and sells them to a laptop manufacturer. If the fan manufacturer were to offer consulting services to the laptop manufacturer concerning how to optimize other components of the laptop to particular fans, the fan manufacturer could be considered to be offering a PSS to its industrial customer. Interestingly, the firm that produces cooling fans could also offer guarantee and repair services for these fans to the final customers. In this servitization case, the fan manufacturer would offer a PSS to final customers, bypassing the laptop manufacturer.

As is clear from this example, whether and what kind of PSS to offer, and how to do so, are questions that are highly relevant from the perspective of industrial marketing and b2b, not just for firms that offer their goods directly to consumers. Manufacturers located at different stages of the value system will attempt to create and appropriate a larger share of the eventual value to the final customers (Mol, Wijnberg, and Carroll, 2005); offering a PSS as a result of the process of servitization can be a successful strategy for achieving this.

Although in theory there are many benefits of a PSS, in practice producers often struggle to enhance their performance by developing a PSS (Baveja et al., 2004; Neely, 2008; Stanley and Wojcik, 2005; Ulaga and Reinartz, 2011). In part, this seems to be due to the facts that the concept of a PSS is still emerging (Sundin, Lindahl, and Ijomah, 2009), the literature focusing on PSS' is limited (see for a review Reim, Parida, and Örtqvist, 2014), and there is a lack of clarity or at least consensus about how a PSS should be understood. These factors make it harder to develop PSS' that have the greatest competitive benefits in a systematic fashion (Spring and Araujo, 2009). The primary purpose of this paper is to propose a new framework that defines products, services, and PSS' from the perspective of how these offerings create value for the customer, and to show how this framework can contribute to developing competitively effective PSS', especially for firms that consider the servitization route.

The sections below discuss the previous literature on PSS, to propose a framework that enables the offering of a new definition of PSS. Subsequently, the results of two empirical studies are presented. One of these studies is a survey-based study of product and service developers; this study established that the way these professionals think and make decisions about the characteristics of products versus services corresponds well to the framework and definition proposed here. The second study is an experiment that used an auction website that one of the authors developed, to study how consumers value the product and service components of a PSS and how their valuation is affected by whether or not the offering is explicitly described as a PSS. In the last section a discussion and suggestions for future research are provided.

2.2 Theory

2.2.1 Defining PSS

There is no generally accepted definition of a PSS (Mont 2002a). A basic description of a PSS is a system that consists of products and services that fulfil customers' needs (Goedkoop et al., 1999; Mont, 2002b; Manzini and Vezzoli, 2003; Tukker, 2004). The act of combining products and services is essential to a PSS. In the existing literature products and services are generally considered different. The four main differences between products and services that were identified in the existing literature are: intangibility, simultaneity, heterogeneity, and unstorability (or perishability) (Easingwood, 1986; Jaw, Lo, and Lin, 2010; Johne and Storey, 1998; Morelli, 2002; Nijssen et al., 2006). Intangibility or the degree of material intensity refers to the fact that services are not material-based. Being material-based also implies that something can be physically stored. Unstorability or perishability relates to the fact that services only exist in time and not in space; thus, they cannot be stored.

Simultaneity deals with the simultaneous production and the consumption of services, which implies interactions between producers and consumers. As noted by Santamaria et al., (2012, p. 147): "Interaction with customers is a distinctive and – in some services – a fundamental element of the service process." Indeed, the design of customer interactions – how the service is to be delivered to the customers – has been acknowledged as an essential element of new service development (Johne and Storey, 1988; Secomandi and Snelders,

2011). Due to this interaction, services tend to be heterogeneous. Heterogeneity makes the service likely to be experienced differently each time it is consumed. Thus, the four differences can be reduced to two core differences with respect to tangibility and producer-consumer interaction. The next subsection builds on this core distinction, but first what it means to combine products and services in a PSS is explored.

Shostack (1977; 1982) proposes that all products and services consist of combinations of product and service elements, and that the balance between those elements determines whether the combination is perceived as a product or a service. However, for the development and marketing of effective PSS', it seems beneficial to establish when a product with service elements or a service with product elements becomes an effective PSS. If almost anything can be labeled as a PSS, the PSS term appears meaningless. This paper proposes that, to develop an effective PSS – in the sense that customers perceive the added value of the PSS –, the products and services that make up the PSS should have 'autonomous' value for the customers. 'Autonomous value' means that the products and services that comprise the PSS could be sold separately as stand-alone offerings on the market.

It may be that a product or service is specifically developed for the PSS and it did not exist as an autonomous offering before the market introduction of the PSS. However, whenever the product or service has such customer value that in theory it could be sold separately, it fulfills the criteria. For example, some services are required during the purchase decision – e.g. to make the customer buy the offering – but do not possess enough value to make customers willing to pay extra for them. Next to having autonomous value, the combination of the products and service elements in a PSS should be 'super additive' or synergetic (i.e. the whole is valued higher than the sum of its parts) rather than 'additive' (i.e. the whole equals the sum of its parts) or sub additive (i.e. the whole is less than the sum of its parts). This is in line with Shankar, Berry, and Dotzel (2007) who suggest that PSS' are systems that create more customer benefits than if the products and services were available separately.

From a business perspective it seems beneficial to invest in a PSS, if in the perception of the customer, the PSS adds more value than when the product and service are sold separately on the market. PSS producers should thus make sure that customers perceive the added value of this combination. Unfortunately this is not always the case. For example, as demonstrated by Ulaga and Reinartz (2011), for PSS' that

ensure proper functioning of the seller's product during all stages of its lifecycle (e.g. product lifecycle services such as maintenance contracts or take-back agreements), the services provided were considered a 'must have' by customers. Thus, these customers showed a low willingness to pay extra for such services. In other words, the services did not provide significant added value for the customers, and the PSS was not effective.

In addition to developing PSS' that are effective, it is also essential to effectively position the PSS in the market. PSS' combine product and service elements; thus, they cross categorical boundaries. This is relevant because categorization is an essential element of human information processing (Eguaras, Domezain, and Grijalba, 2012). Indeed, as shown in prior research, when a product crosses categorical boundaries, customers' experience more difficulty categorizing this product (Gregan-Paxton et al., 2005; Moreau et al., 2001), which in turn negatively affects customers' product evaluations (Goode et al., 2013; Gregan-Paxton, et al., 2002; Noseworthy and Trudel, 2011). In addition, research in marketing and psychology has suggested that people mainly use knowledge from one category to make sense of and evaluate new products (Moreau et al., 2001; Murphy and Ross, 2010; Rajagopal and Burnkrant, 2009), which may result in customers not perceiving the synergetic benefits of a PSS. Gregan-Paxton et al. (2005), however, found that customers were able to hold multiple category beliefs about products that cross multiple categories when both categories are communicated at the same time. Therefore, this paper proposes that in the case of PSS' – in which both the product and the service elements have autonomous added value, it is important that the product and the service elements are communicated and emphasized in order to generate synergy in the eyes of customers.

2.2.2 PSS: Value resulting from what is tangible or intangible or from the presence or absence of producer-consumer interaction

As discussed above, products and services differ in two basic ways: with respect to tangibility and to interaction. The tangibility is part of what the design literature terms the 'manifestation', which describes the form or expression of the offering (Hekkert and van Dijk, 2011). Two related points must be made here. First, if we look at products and services from

an economic perspective, focusing on value creation, the essential issue is whether the tangible or intangible elements add value. Second, few products are exclusively tangible and even fewer services are exclusively non-tangible. Products may possess aspects that are intangible and services may have tangible aspects. This has an effect on how customers use and experience the products or services (Margolin, 1997; Schifferstein and Hekkert, 2011). However, not all intangible aspects of a product can contribute to the economic value of that product, nor can all tangible aspects of services add economic value.

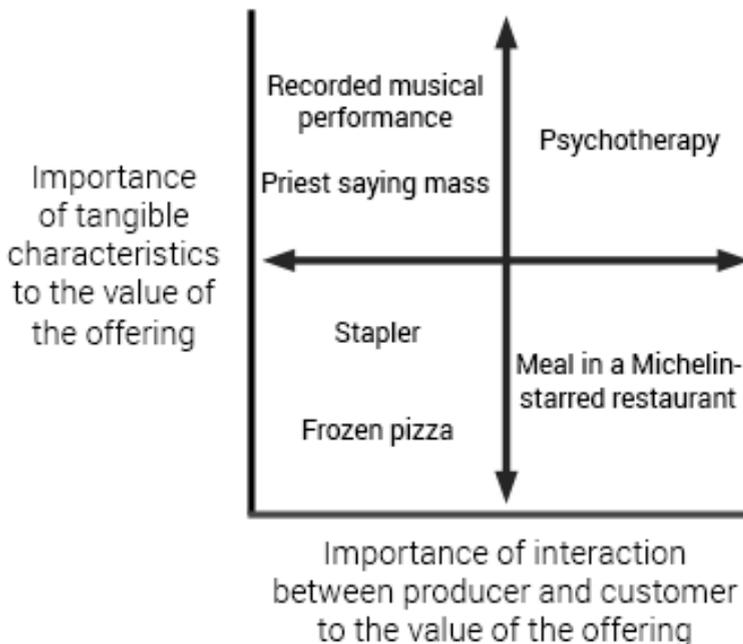
The second core distinction that was noted is the presence of (repetitive) interaction between producers and customers, and particularly the degree to which this interaction contributes to the value of the offering. Of course, tangibility and interaction can interact in the sense that being tangible or intangible can have a strong influence on the type of interaction that a customer has with an offering (Boztepe, 2007). In the case of a manifestation with high material intensity (a product), interaction is mainly physical in nature (a customer can touch, smell, see, and hear the product). Interaction is also rather 'static'; the type of interaction a customer can have with the product is determined beforehand and in general cannot change over time. However, interaction as a core characteristic of services denotes producer-consumer interaction. In the case of services, this producer-consumer interaction is mainly 'non-material' and dynamic. Even though a blue print can be made of the different stages in a service, the interaction cannot be fully 'pre-programmed' since services are co-created with customers, and these customers and the circumstances in which the services are provided may change each time a service is delivered (Bitner, Ostrom, and Morgan, 2008). This 'real', dynamic interaction between producer and customer means that they adapt their decisions and behavior to each other in a way that cannot be completely pre-programmed, and this real interaction must create additional value – as perceived by the customer. This interaction can occur at different points of time in a life cycle of a service or a PSS. Interaction generally takes place before or during a purchase, but it may also take place after a purchase. Indeed, one of the main motives of PSS providers for offering both products and services is that PSS' allow for more long-term relationships between a supplier and a customer.

The matrix shown below in Figure 2.1 shows both of these dimensions. The use of arrows in the matrix indicates that the dimensions are not dichotomous (e.g. an offering scores either high or

low on intangibility; an offering asks either for no or high interaction); rather, they are continuous (an offering can score according to all different kinds of degrees on the degree of intangibility and interaction needed). The matrix also suggests the symmetric character resulting from the focus on value creation. The value of a product resides in the tangible characteristics, but a product can also create additional value because no interaction is needed (for instance, a customer prefers an iRobot Roomba over a cleaning lady or a book over a lecture), the value of a service resides in the interaction, but can create additional value because it is intangible (for instance, you do not need space in your house for the lectures you have attended, while books require space).

An offering that scores low on both dimensions is a straightforward product – for example, a stapler – in the lower-left quadrant of the matrix; an offering that scores high on both dimensions is a straightforward service – for example, psychotherapy in the upper-right quadrant. In the upper-left quadrant there are offerings, the value of which mainly has to do with intangible characteristics – for example a musical performance on a CD – though interaction between producers and customers is minimal. In the lower-right quadrant are offerings, the value of which mainly has to do with tangible characteristics, but that need producer-customers interaction to fully create the value – for example a meal in a good restaurant.

Figure 2.1 Product-service 2x2 matrix



To consider something an effective PSS, it should consist of a) more than one offering that has a (potential) separate final market, b) when combining the separate offerings, the resulting combination should create synergy (superadditive value) in terms of being valued more together (by customers) than the sum of the separate components, and c) the offerings should come from different quadrants of the 2x2 matrix (see Table 2.1). If the offerings come from the lower-left and upper-right quadrants of the matrix then one has the most 'pure' PSS, with the original components contrasting maximally.

Table 2.1 PSS principles

1. PSS` should consist of more than one offering that has a (potential) separate final market.
 2. Combining the separate offerings should result in superadditive value.
 3. The offerings should come from different quadrants of the 2 x 2 matrix.
-

The two dimensions identified above to identify 'effective' PSS', the degree of tangibility and the degree of interaction, are not only valid from a business perspective, they are also valid from a product development perspective. Indeed, when designing PSS', the main challenges for designers include creating coherence between the tangible aspects of the product and the non-tangible aspects of the services and, on the other hand, designing customer-friendly interactions between producers and customers (Ulaga and Reinartz, 2011).

To test ideas regarding the proposed 2x2 product-service matrix (Figure 2.1), innovation experts were queried. To test the proposed PSS principles, customers' willingness to pay for a combination of product and service elements that – in theory – can be identified as a PSS was measured. An experiment was also conducted that tested different ways of positioning this combination. Below, we discuss the set-up and outcomes of these two empirical studies in more depth.

2.3 Study 1: Survey among product and service developers

2.3.1 Method

This first study examined whether product and service developers, who are the core people who decide which characteristics of an offering could generate value to consumers, consider these characteristics similar to the way we considered the differences between products and services, leading up to our definition of a PSS. To test the proposed 2x2 product-service matrix (Figure 2.1) an online survey was sent to two groups of experts. The first group of experts consisted of product and service development managers who were members of a Dutch association for product and service development (PDMA). In total 84 development managers were contacted, of which N = 37 participated in this study (a response rate of 44%). The second group of experts consisted of experienced product and service designers who were participating in a Dutch research project named Creative Industries Scientific Program (CRISP), of which this current study is part of.

CRISP focuses on generating and disseminating knowledge about how to develop and design PSS' (www.crispplatform.nl). Several design agencies, multinational organizations, and universities are participating in this project. The two largest design agencies that participated in CRISP were selected. In total 63 designers working for these two design agencies were identified and contacted, of whom N = 44 – evenly spread across the two agencies – agreed to participate (a response rate of 70%). The two groups of experts added up to N = 81, of which 77.8% were men. The average age was 38.7 and the average years of work experience was 11.75. The majority of this group (88.9%) indicated that they had experience with the development or design process of a PSS.

This survey focused on the extent to which the experts agreed with the proposed distinction between products and services. Respondents were asked questions to assess whether value creation by means of adding tangible elements to an offering and value creation by means of (repetitive) interaction moments were more important for products or for services. Respondents could respond using a five-point scale (1 = only important for products, to 5 = only important for services).

2.3.2 Results

Table 2.2 provides descriptive statistics and correlations for the relevant variables used in this study. The means show that the value creation through tangible elements is – according to our experts – more important for products than for services (i.e. the mean is closer to zero than to five). The means of the importance for value creation through interaction moments and repetitive interaction moments show that these two elements are more important for services than for products. In addition, these two elements are positively correlated ($r = .60, p < .01$).

Table 2.2 Descriptive statistics

<i>Variables</i>	<i>Mean</i>	<i>s.d.</i>	<i>1</i>	<i>2</i>
1. Importance of tangible elements: products vs. services	1.90	.68		
2. Importance of interaction moments: products vs. services	3.44	.87	-.12	
3. Importance of repetitive interaction moments: products vs. services	3.63	1.07	.07	.60**

$n = 81, ** p < .01$

To investigate whether the differences in means were significant, a paired sample t-test was conducted. Table 2.3 provides the results of the paired sample t-test. The results show that there is a significant difference between the means of the importance of value creation through tangible elements and (repetitive) interaction moments ($t = -11.95, p < .01$). This implies that the respondents in our sample considered tangible elements more important for products than for services in terms of characteristics that create value. The other way around counts for (repetitive) interaction moments, which were considered more important for services than for products in terms of

characteristics that create value. To further investigate the robustness of these results, whether the two different groups of experts (i.e. developers and designers) showed consensus in their answers was analyzed; this was indeed the case, since for the relevant variables in this study there was no significant difference between the two groups of experts.

Table 2.3 Paired sample t-test to measures differences in means for the importance of value creation

<i>Variables</i>	<i>Mean Difference</i>	<i>t</i>
1. Importance of tangible elements Importance of interaction moments	1.54	-11.95**
2. Importance of tangible elements Importance of repetitive interaction moments	1.73	-12.70**
3. Importance of interaction moments Importance of repetitive interaction moments	0.22	-1.89

$n = 81$, ** $p < .01$

2.4 Study 2: Experimental auction

2.4.1 Method

In this second study we conducted an experiment to study the effects of how a good that has product and service characteristics is presented to consumers on willingness to pay. The goal was to determine whether emphasizing both the product and the service elements – and therefore emphasizing the PSS character of the PSS – elicited a higher willingness to pay (WTP) than emphasizing either the product or the service elements alone. In addition, whether emphasizing the product elements compared to the service elements (or vice versa) of a PSS had a significant effect on WTP was tested.

This experiment was conducted using a Vickrey auction – also called a second-price-sealed-bid auction (Vickrey, 1961). In a Vickrey auction respondents place one bid and do not see what others are bidding. The winner of the auction pays the second highest bid. An important characteristic of a real second-price auction – compared to measuring hypothetical WTP – is that respondents have a stronger incentive to bid their true WTP. Research shows that experiments measuring hypothetical WTP overstate the amount that customers are willing to pay by up to three times compared to real WTP (List and Gallet, 2001).

Respondents were invited by email to participate in the auction. Upon receiving the invitation respondents had 12 hours to start the auction by clicking the link in the email. Respondents first had to participate in two trial auctions to become familiar with the second-price auction. After completing the trial auctions and agreeing with the rules of the auction the treatment was shown. From that moment they had six minutes to place and confirm their bid. After confirming their bid they answered a few questions regarding their demographics (e.g. gender, age, address). In addition, they were asked whether or not they thought that the combination of the specific product and service was a successful combination (1 = Yes, 2 = No).

After closing the auction all respondents were sent an email that mentioned whether or not they won the auction. In the email to the respondents who did not win the auction the amount of the bid of the winner and the second highest bid that the winner had to pay were provided. The email to the winner mentioned his or her own bid and the second highest bid that he or she had to pay. An invoice was also added and after paying the invoice, the good was sent to the winner.

The auction object consisted of a combination of an activity tracker (the product element) and an online (but real) personal coach (the service element). The objective of this combination was to make customers more active and healthy. The activity tracker measures customers' daily activity. The data can be viewed on a computer. The online personal coach gives advice to the customer based on this data. Both elements can be found separately on the market and have autonomous value. That is, devices that measure customers' daily activity (e.g. from simple pedometers to more advanced devices that measure much more than the steps one takes) can be found in stores. Online personal coaches – which customers have to pay for – are also found on the market. Furthermore, it was expected that combining the

activity tracker with the personal coach would result in a PSS with super additive value because the online personal coach could provide more grounded advice, due to the data collected through the activity tracker; thus, customers would be motivated to use the activity tracker (more often) because of the feedback that they could receive from the personal coach.

The experiment followed a 1x3 design that contained three different treatments. Respondents were randomly assigned to one of the three experimental conditions. The treatments varied in the degree to which the PSS was positioned as a product, a service, or a combination of the two. In all treatments the researchers communicated – by means of a description and an image – both the product and the service elements. However, depending on the treatment either the product or the service was emphasized by adding the category label and increasing the size of the relevant description and image. The treatment that emphasized the combination showed the category labels of the product and the service, and both descriptions and images were the same size.

Respondents were recruited through two Dutch panel agencies. Those agencies sent an email to a part of their panel – which was representative of the Dutch population – asking the panel members to sign up for the auction platform (respondents signed up at: www.veylinx.com). Panel members at those agencies can earn points that can be exchanged for gifts or discounts. By offering them points the members were incentivized to sign up. Both panel agencies offered a similar number of points that represented a similar amount of monetary value. Whether or not the responses between the respondents from the two separate panel agencies differed was measured, and they did not. A total of 1776 panel members signed up. Those panel members were invited to participate in the auction, and 44.20% (N = 785) of them completed the auction by placing a bid and answering a short survey. The panel members did not receive an incentive to participate in the actual auction. The average age was 43 years and 50.4% were female.

2.4.2 Results

Table 2.4 shows the descriptive statistics for the three treatments. The N between the treatments differs slightly because respondents were randomly assigned to one of the treatments prior to sending the invitation. In addition, they had the opportunity to abort the auction. For both treatments the minimum bid was zero Euros. This can be

explained by the fact that we invited a representative sample of the Dutch population, including people who were apparently not interested in the product. On average 38% placed a bid equal to zero Euros. As shown in Table 2.4, our respondents were willing to pay more for the PSS when it was positioned as a PSS instead of a product or service.

Table 2.4 Descriptive statistics of WTP (in Euro's) per treatment

<i>Treatment</i>	<i>N</i>	<i>Mean</i>	<i>S.E. Mean</i>	<i>Std. deviation</i>	<i>Min.</i>	<i>Max.</i>
Product-focused	269	8.18	.74	12.07	0	80
Service-focused	230	6.70	.96	14.63	0	100
PSS-focused	286	8.89	.74	12.51	0	90
All treatments	785	8.04	.47	13.04	0	100

To test whether the means were significantly different, a Mann-Whitney test was performed. This non-parametric test was used because the dependent variable (i.e. WTP) was not normally distributed. Table 2.5a shows that respondents were willing to pay more (Mann-Whitney $U = 260.46$, $Z = -4.206$, $p = .000$) when they were shown the treatment in which both elements were equally emphasized (the PSS-focused treatment) compared to the treatments in which the service elements were emphasized.

If, however, the WTP between the product-focused treatment and the PSS-focused treatment is compared (see Table 2.5b) the WTP for the PSS focused treatment is higher, but this result is not significantly different (Mann-Whitney $U = 371.19$, $Z = -.730$, $p = .466$).

Table 2.5a. Mann Whitney test results for differences between service-focused treatments and the PSS-focused treatment

	<i>Mean rank: Service- focused (N)</i>	<i>Mean rank: PSS-focused (N)</i>	<i>Mann Whitney U</i>	<i>Z</i>	<i>P</i>
WTP	2.29 (230)	2.83 (268)	260.46	-4.21	.00
WTP of top 50% of the bids	1.06 (115)	1.52 (147)	55.10	-486	.00
WTP of top 50% of the bids excluding the respondents who did not consider the PSS a good combination	0.80 (82)	1.03 (103)	31.50	-2.98	.00

Table 2.5b Mann Whitney test results for differences between product-focused treatments and the PSS-focused treatment

	<i>Mean rank: Product- focused (N)</i>	<i>Mean rank: PSS-focused (N)</i>	<i>Mann Whitney U</i>	<i>Z</i>	<i>P</i>
WTP	2.73 (269)	2.83 (286)	371.19	-.73	.47
WTP of top 50% of the bids	1.37 (139)	1.50 (147)	92.69	-1.37	.17
WTP of top 50% of the bids excluding the respondents who did not consider the PSS a good combination	0.92 (93)	1.04 (103)	42.15	-1.46	.14

When the product-focused treatment was compared with the service-focused treatment (see Table 2.5c), a significant difference

(Mann-Whitney $U = 254.27$, $Z = -3.566$, $p = .000$) was found with the product-focused treatment, resulting in a higher WTP.

Table 2.5c Mann Whitney test results for differences between product-focused treatments and service-focused treatment

	<i>Mean rank: Product- focused (N)</i>	<i>Mean rank: Service- focused (N)</i>	<i>Mann Whitney U</i>	<i>Z</i>	<i>P</i>
WTP	2.70 (269)	2.26 (230)	254.27	-3.57	.00
WTP of top 50% of the bids	1.45 (139)	1.07 (115)	561.60	-4.10	.00
WTP of top 50% of the bids excluding the respondents who did not consider the PSS a good combination	0.95 (93)	0.80 (82)	315.20	-1.99	.05

As a robustness check, Tables 2.5a, 2.5b, and 2.5c also show the differences in the means of WTP for the top 50% of the bids and the means of WTP for the top 50% of the bids, excluding the respondents who indicated that they did not consider the product and service elements in the PSS a successful combination. These two separate measures reduced the amount of zero bids and the number of people who might be less interested in the PSS because they did not think the PSS was a successful combination. The results show similar effects to the analysis in which only WTP was used.

Together, the results show that our respondents were willing to pay more when the PSS-focused treatment was used compared to the service-focused treatment. These results, however, do not show a significant difference for when the PSS-focused treatment was compared to the product-focused treatment. The p -value declined when focusing on the respondents that might be more interested in the PSS (i.e. selecting the top 50% of the bids and eliminating the respondents who did not think the PSS was a successful combination), but it is still not significant. Furthermore, our respondents were willing to pay significantly more in the case of the product-focused treatment

compared to the service-focused treatment. Overall, the results suggest that the PSS tested in this study is considered a weak PSS, as evidenced by the relatively low WTP for the service component of the PSS. As a PSS it is not entirely effective, because equally emphasizing both the product and the service elements did not result in a significant increase in customers' WTP compared to the product-focused treatment. However, the results do suggest that customers' WTP can be strongly influenced by whether the positioning of the good is PSS-, product-, or service-focused.

2.5 Discussion

In this study a framework that can be used to identify and develop effective PSS' is introduced. Offering PSS' means combining products and related services, and this often requires that a firm positioned in one stage of the value system offers additional products or services that are or could be offered by other firms in other stages (Neely, 2008, 2010). In such cases, the decision of whether or not to offer a PSS also requires a particular strategic choice with regard to vertical competition for the greater share of value to the final customer (Mol et al., 2005). If a B2B firm, similar to a B2C firm, decides to offer a PSS, they must decide which product and service elements will be combined and how it will be offered; this requires a clear understanding of whether and how a PSS creates value for the final customer. The main purpose of this paper is to propose a framework that allows firms to consider these decisions in a systematic fashion and to show how this framework can be used to investigate specific aspects that impact the effective development and marketing of PSS'.

This framework builds on the core idea that products and services differ from each other with regard to the value that is created by the tangibility or non-tangibility and the interaction or non-interaction between producers and customers. The findings suggest that the products and services that make up the PSS should have 'autonomous' value for the customer, meaning that they could be sold separately as stand-alone offerings on the market. This distinction helps to separate 'real' PSS' from offerings that, in essence, are either products or services even though they combine service and product elements. The proposal that the products and services that make up a PSS should have autonomous value does not preclude another important element of

effective PSS'; namely, that the product and service elements that are combined in the PSS should be combined in such a fashion that synergy is created.

Two empirical studies provide evidence of the validity of this framework. In the first study, for the sampled product/service developers agreed with the proposed difference between products and services (i.e. tangibility and interaction). The second study examined how to effectively position a PSS in the market by measuring whether emphasizing the PSS character of a PSS, compared to emphasizing either the product or the service elements, had an effect on customers' WTP. The results show that the manner in which a PSS is positioned in the market can indeed have a strong effect on customers' WTP. The PSS tested in this study did not appear to be an effective PSS because emphasizing both the product and service elements compared to only the product elements did not result in a significant increase in customers' willingness to pay, and – therefore – did not create synergy. From a business point of view, the service elements in the examined combination could be omitted because they did not significantly increase customers' willingness to pay.

2.5.1 Managerial implications

For product producers that want to engage in servitization in order to develop PSS', it is important to test whether the product and the service elements – when they are combined – create synergy in terms of being valued more together than as separate parts. As found by Ulaga and Reinartz (2011), managers consider the realization of synergy in PSS creation a major challenge. The current trend is that manufacturers combine their existing offerings with new services. Currently PSS' are not often developed 'from scratch'. However, in order to develop a PSS in which product and service elements interact synergistically for value creation, rather than in a mere additive manner, this may be required.

As a suggested first step for creating an effective PSS, producers should choose to combine products and services that, at least in theory, have autonomous value on the market and, when combined, result in a PSS that is valued more than when the product or service was separately available on the market. As a second step, they should examine the degree of tangibility and the degree of interaction. For an effective PSS, there should be a high degree of tangibility (product elements) and a

high degree of interaction (service elements). Third, products and services should be combined in a coherent, synergetic fashion. Synergy can be created by designing PSS' with different parts of a system that adhere to the same strategy regarding customer experience. Testing whether or not a PSS is delivering synergetic value compared to the delivery of the separate components could be easily tested by using a Vickrey auction –as demonstrated in this paper. The benefit of a Vickrey auction, compared to, for example, customer surveys or a customer panel, is that real buyer behavior can be observed, rather than mere stated intentions.

As proposed in this paper, both product and service elements are important to how customers value the PSS. However, product-oriented producers that want to combine some of their products with services might lack sufficient capabilities and experience to develop and offer services that are valued by customers, as evidenced by this experiment. In a similar fashion, service-oriented producers may lack the necessary capability and experience to effectively develop the product-part of a PSS. Solutions for this problem include investing in the development of these capabilities or forming strategic alliances with complementary producers – which, in general is a more efficient solution. For example, producers could bypass downstream firms or eliminate upstream firms by forming alliances with producers in other positions in the value system.

Producers that extend their product or service portfolios with a PSS experiment with and exploit new business opportunities. This in turn requires that these producers adapt and renew their business models to achieve sustained value creation (Mason and Mouzas, 2012). Indeed, as suggested in prior literature (Baden-Fuller and Haefliger, 2013; Teece, 2010), business model choice plays an important moderating role in explaining how technological innovation affects corporate performance. A business model comprises the 'architecture' of how a producer creates, delivers, and captures value (Teece, 2010). Regarding business model elements, Baden-Fuller and Haefliger (2013) identify the following dimensions: customer identification, customer engagement, value chain linkages and monetization. Regarding customer engagement, for example, PSS` can change the value proposition of a producer from delivering standardized, mass-production products towards more customization and tailor made solutions. Regarding value chain linkages, producers may need to go from a 'hierarchy' to a network structure (Mason and Mouzas, 2012), as

noted above, to build the necessary capabilities and resources for an effective PSS. Regarding monetization, producers could adopt a razor-blade model (Teece, 2010), in which pricing is done such that the service-part of the PSS subsidizes the product part. Furthermore, producers could adopt a payment system in which payment is done during or after use rather than upfront, as is common for products.

2.5.2 Limitations and future research

The empirical validation of this framework has some limitations. In the survey, product and service developers were only asked whether they agreed with the proposed ideas about the differences between products and services. Although they are the persons normally responsible for developing and designing the product or PSS, other types of employees such as marketing managers might also influence what will be developed and how it will be positioned. It would be interesting to examine if these marketing managers also agree with the proposed differences.

The second study only used one example of a PSS to measure how customers value a PSS and its separate elements. There are, however, many more and different types of PSS' available on the market. For example, Tukker (2004) discussed eight different types of PSS' that can be divided into three groups (i.e. product, use, and result oriented). Knowledge is required to determine the extent to which a given customer experience must be provided by the product-part, to what extent it must be provided by the service part of a PSS, and how this differs per PSS-type. In addition, future research could examine how customers value these different types of PSS' and how to best position the PSS so that customers see its superadditive value.

As PSS' are often offered through partnerships between multiple producers, future research could investigate which type of producer (for example the product or the service provider) is most suited to be the main 'face' on the market when selling the PSS. In other words, how the PSS should be branded. If it is branded using the names of all producers in the partnership or using a brand name that does not fit with the identity of the PSS, it might generate ambiguity in the eyes of customers. Therefore, knowledge is needed to determine how these partnerships should communicate the PSS, by taking their own brand equity into account.

Chapter 3

CATEGORY MARKERS: HOW ORGANIZATIONS INFORM CONSUMERS ABOUT CATEGORICAL IDENTITIES OF HYBRID PRODUCTS

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Abstract

Hybrid products combine functionalities of products from at least two categories. As shown in prior research, hybrid products tend to be more difficult to categorize. However, because of this they also allow the producer greater freedom in assigning categorical characteristics to the hybrid. We introduce the concept of category markers to refer to design characteristics that do not significantly affect the value of the product as a member of a particular category, but whose main function is to convey its categorical identity. Designing a hybrid product, an organization – and more specifically the product designer – must choose whether to employ category markers of either one of the two categories, or one or none of the markers. This paper examines whether or not the competitive position and context of the organization has an effect on designers' design decisions to use category markers. Structured interviews were conducted with 71 industrial designers to show that the market share of the producer in the product categories from which the hybrid is constituted, and the maturity of these product categories affects the choices of designers about whether or not use the category markers of these constituent categories.

3.1 Introduction

Hybrid products combine functionalities of products from at least two categories. As shown in prior research (Gregan-Paxton et al., 2005; Moreau et al., 2001), hybrid products tend to be more difficult to categorize, which can result in a lack of appreciation of the functionalities of the hybrid product. Product evaluations can be negatively affected when consumers cannot easily assign a product to a category (e.g., Gregan-Paxton et al., 2002; Lajos et al., 2009; Noseworthy and Trudel, 2011). Therefore, producers of new hybrid products will need to pay greater attention to the facilitation of the categorization of the hybrid product by the consumers. However, they also have more choices in the categorical characteristics that they can assign to their products, precisely because the new hybrid product does not come with a taken-for-granted categorical identity.

Categorization of hybrid products can be facilitated by means of signals about the product, which are often textual in nature (e.g., explaining the different functionalities of a hybrid product in an advertisement). However, the design of a product itself – in terms of visual appearance – can also effectively signal the category to which a product belongs (e.g. Bloch, 1995; Creusen and Schoormans, 2005). In this study, the concept of category markers is introduced to refer to design characteristics – such as color, shape, texture and symbols – that have a primary function of conveying a product’s categorical identity, but that do not significantly affect the value of the product as a member of a particular category. An example is the color white for household appliances such as washing machines and fridges. A fridge does not need to be white, blue may be more esthetically pleasing which would add value, but it would make more people wonder whether the object is truly a fridge. This confusion with categorization could have negative consequences on the perceived value of consumers. However, if the fridge is white, consumers are better able to categorize it as a fridge; once it is categorized as a fridge the color white does not further impact the value of the fridge compared to alternatives in that category.

There is a wide ranging literature on the effects of being perceived to belong to more than one category – so-called category spanning (Hsu 2006, Leung and Sharkey, 2013). Furthermore, the impact of category-specific design elements on consumers’ categorization of (innovative) products has received attention in the literature (Blijlevens, Gemser, and Mugge, 2012; Bloch, 1995; Creusen and Schoormans, 2005;

Goode et al., 2013; Mugge and Dahl, 2013; Radford and Bloch, 2011). This study constructs hypotheses based on results from previous studies. However, it does not examine the effect of the outcome of new hybrid product design decisions on actors who are external to the organization (e.g. consumers); rather, how organizations make new hybrid product design decisions is studied. There is, as of yet, no research that takes the perspective of the organization that offers the hybrid product and studies the determinants of the strategic design decision to make it more or less likely that the consumer will recognize the hybrid product as belonging to one particular category or to both categories. This study intends to fill that void in the literature by theorizing about and testing how organizations use category markers to position their hybrid products. The focus is on the influence of the competitive position and the competitive context of organizations on their decisions to use category markers when designing new hybrid products. In relation to competitive positions, the effect of the market share of organizations in the relevant categories is examined; in relation to competitive context, the effects of the maturity of the relevant categories are examined.

The hypotheses were tested by conducting structured interviews with designers and querying them about their decisions to use category markers in a range of possible contextual scenarios. During new product development, designers often decide – or at least strongly influence – what the product will look like in terms of shape, color, or graphic elements; thus, they consciously or unconsciously also make decisions about the use of category markers.

The results show that an organization's competitive position and the competitive context influence their design decisions. When organizations have a large market share with a product and decide to combine that with functionalities from another product category that they do not offer, designers are more likely to use the category markers of the product with the large market share. When the constituent product categories are emerging rather than mature, organizations are less likely to use any category markers from these categories for the hybrid product. Finally, when two product categories are combined in a hybrid product, of which only one category is mature, organizations are likely to use the markers from the mature category. The following section provides a review of the relevant literature and formulates hypotheses. The method section describes the empirical setting, and the data collection process and measures. The results are then presented and discussed, and a conclusion completes the paper.

3.2 Theory

3.2.1 Category markers

The way a product looks is important for how it will be categorized and compared to alternatives in a category that the consumer is already familiar with (Eisenman, 2013; Creusen and Schoormans, 2005; Rindova and Petkova, 2007). Consumers will use prior knowledge – if available – to categorize new products (Gregan-Paxton et al., 2005; Moreau et al., 2001; Noseworthy and Goode, 2011). In the case of a positive match between the visual product characteristics experienced by a person and the person's knowledge schema of a category, the product will be categorized as belonging to that category.

Research has shown that product evaluation is positively affected when consumers are able to easily assign a product to a category (Goode et al., 2013; Gregan-Paxton, et al., 2002; Lajos, et al., 2009; Noseworthy and Trudel, 2011). This can be explained by the effect of processing fluency, which is the ease with which information is processed (Reber, Winkielman, and Schwarz, 1998). When a product (or its context) bears typical characteristics that clearly represent a category, consumers are able to fluently process this information, which in turn has a positive influence on consumer evaluations (e.g., Blijlevens et al. 2012; Veryzer and Hutchinson, 1998).

This study introduces and uses the concept of 'category markers', which are design characteristics that do not significantly affect the value of a product as a member of a particular category, but that have a main function of conveying its categorical identity. The category marker is a much narrower concept than that of the category cue featured in earlier literature about design and categories (e.g., Goode et al., 2013). Those category cues usually also add value to a product in its category. This distinction is important because organizations have a much larger degree of freedom to modify product characteristics that affect consumers' categorizations of a product, but which do not affect that product's value in its category. For example, some cars have racing stripes to communicate that the car is to be categorized as 'sporty'. However, racing stripes on a car do not make the car drive or drive faster. Once the car is categorized as 'sporty', the racing stripes have no further impact on its value compared to other alternatives of 'sporty' cars with racing stripes.

It is also important to note that the category marker does not need to be recognized as a general symbol that denotes a category; often, it functions in a particular context, by distinguishing one category from a similar category that it could be confused with. For instance, blue is a category marker of baby boy's clothing versus pink for baby girls' clothing. The essential role of the category marker is that it facilitates categorical labeling by consumers. When it is possible that the consumer is uncertain about the proper categorical label, the category marker will provide an indication, without necessarily adding to the usefulness or decorativeness of the product that is considered a member of a particular category. The focus of this study is on organizations' strategic design decisions during the development phase of a hybrid product. During this development phase, organizations decide what a hybrid product will look like. Although functionalities from two different categories are combined, the market might perceive the product as primarily belonging to only one category if category markers from only one specific category are used. But, when category markers from two categories are used, or if no category markers from the constituent categories are used, the risk is increased that consumers will be unsure of or confused by how to categorize the hybrid.

Earlier research has shown that consumers generally tend to use knowledge from only one category to make sense of and evaluate new products (Gregan-Paxton et al., 2005; Moreau et al., 2001; Murphy and Ross, 2010; Rajagopal and Burnkrant, 2009). However, Moreau et al. (2001) also demonstrated that when the number of markers per category is limited, it is much easier for consumers to use both categories to make sense of the new product. In addition, Gregan-Paxton et al. (2005) found that consumers can hold multiple category beliefs about a hybrid product when both categories are communicated at the same time. They also indicated that this depends on the nature of the category cues used (visual versus textual) and consumers' familiarity with the categories. The more visual the category cues and the more familiar the categories are to the consumer, the easier it is for consumers to apply a multiple-category inference strategy to make sense of a hybrid product (Gregan-Paxton et al., 2005). The core question then remains as to the conditions under which the producer of the hybrid will opt for no category markers from the constituent categories, from one, or from both.

3.2.2 Category markers and market share

A common way for organizations to develop hybrid products is to add new functionalities from other product categories to a product that they already offer (Gill, 2008); which category markers they should use is unclear. This can be determined from the perspective of the demand side, and from the supply side of the market. Beginning with the latter, the development of a new product is often influenced by organizations' resources and capabilities that they have accumulated over time (Helfat and Raubitschek, 2000). Organizations tend to make product-level choices that leverage their core strengths (Montgomery and Hariharan, 1991; Helfat and Raubitschek, 2000; Sosa, 2011). This paper argues that when developing category markers, organizations use their current strengths (in terms of resources and capabilities), and their previous experience to make decisions about product features and product appearance. When organizations have a large market share with a product, they are likely to have developed certain beliefs about the product category, as well as certain strengths. Therefore, it was expected that when functionalities of a product with a high market share were combined with functionalities from a product category that the organization has no market share in, the visual appearance of the new hybrid product would show greater resemblance to the product that was already offered.

Similar to the supply side, the demand side of the market can influence decisions during the development of new products. Consumers have expectations of organizations and their products. When organizations decide to add functionalities from another product category – in which they are not active and have no reputation – to a product that they already offer, there might be a risk that consumers' expectations will not be met. This can have a negative effect on product evaluations (Stayman, Alden, and Smith, 1992). If organizations have a large market share with a product in a particular category, consumers will strongly associate these organizations with that category (cf. John, Loken and Joiner, 1998). Consumers' expectations will not be met if the category markers of the product category that an organization is (best) known for are not used. The risk of failure can be reduced if organizations use the category markers of the product category that consumers most associate with them. This is because consumers will be more confident about their categorization of the new product.

The above discussion leads one to expect that when organizations combine functionalities from a large-market share product with functionalities from a product that the organization does not yet offer, they are likely to use the category markers of the category in which they have a large market share.

Hypothesis 1: Organizations that produce a hybrid product by combining one of their high-market share products with a product that they have no market share in are more likely to only use the category markers of their high-market share product.

3.2.3 Category markers and products versus services

In many industries it is increasingly common for organizations to provide services next to the tangible products that they already offer (Santamaria et al., 2012; Ulaga and Reinartz, 2011). Moreover, organizations also offer integrated combinations of products and services – product service systems (PSS) – to gain a competitive advantage (e.g. Antioco et al., 2008; Manzini and Vezzoli, 2003). In a PSS, both the product and service elements are important for how consumers value the PSS (Ulaga and Reinartz, 2011). In other words, services that are added to the product, but that do not make consumers willing to pay extra – such as clothing advice from a clothing store employee when buying a new shirt – will not make this combination a successful PSS.

An important difference between tangible products and services is that services require a different type of interaction with the consumer. The interaction with a tangible product is often purely physical and rather static, while the way consumers interact when consuming a service is often more dynamic and ‘non-tangible’. Moreover, for many services the interaction between the organization and the consumer is an important and often fundamental element of the service process (Santamaria et al., 2012). Indeed, the design of consumer interactions – how the service is delivered to the consumer – is an essential element of new service development (Johne and Storey, 1998). The elements of these interactions (e.g. tone of voice, website, employees’ uniform, and reception desk) also need a visual ‘embodiment’. Therefore, visual elements of services can act as category markers.

PSS' are rarely developed from scratch, and are often a result of adding service elements to a product that the organization already offers (Ulaga and Reinartz, 2011). Organizations that add services to their products were expected to use the product category markers from the product category that they already offer. In addition, when organizations are planning to develop a successful PSS – in which both the product and the service elements offer consumer value – they also want to signal that it is a PSS, by using the service category markers. Not doing this might cause consumers to think that it is a product rather than a PSS, and consumers might not perceive the value of the service elements. Therefore, organizations that already have a large market share with the product were expected to be more likely to use the category markers from the product category and the service category when they decide to combine this product and service into a PSS.

Hypothesis 2: Organizations that create a hybrid product by combining one of their high-market share products with a service for which they have no market share are more likely to use the category markers of both their high-market share product and the service.

3.2.4 Category markers and emerging and mature product categories

Product categories that are emerging typically have no established dominant design (Utterback and Suarez, 1993; Srinivasan et al., 2006), and there is low consensus among actors about the core elements of the categories (Rosa et al., 1999). The dominant design is the design in which its core elements do not substantially differ across products in the same category (Utterback and Suarez, 1993). When the product category is new, organizations are not only motivated to establish the dominant design in terms of functionalities (Murmman and Frenken, 2006), but also in terms of the product category's material embodiment to explain those functionalities (Bijker, 1997; Eisenman, 2013). In general, when a dominant design is established the different products across a category look similar – both in terms of functional features and appearance (Eisenman, 2013) – and consequently typical design elements (or category markers) can be identified more easily. Mature categories,

therefore, often have clearly identifiable category markers, which are familiar to consumers.

As noted above, Gregan-Paxton et al. (2005) found that consumers' familiarity with categories made it easier for consumers to apply a multiple-category inference strategy to make sense of and evaluate a hybrid product. Thus, when organizations decide to combine functionalities from two mature categories – which are equally familiar to consumers – in which they have no market share, these organizations might want to use the category markers of both categories. This emphasizes the hybrid character of the product, but it will not negatively affect product categorization because each of the combined categories is highly recognizable.

When categories are emerging, there is typically no dominant design, and there is often low consensus on the core elements of these categories (Rosa et al., 1999). Therefore, emerging categories might have less clearly identifiable category markers compared to mature categories. Using those less clear category markers might not help consumers evaluate and make full sense of the product. In addition, in the context of emerging categories, organizations may want to become 'the founders' of the dominant design –in terms of functionalities and the material embodiment of those functionalities (Bijker, 1997; Eisenman, 2013) – and thus be motivated to develop new category markers.

Assuming that organizations do not have a market share in either one of the categories that they combine in a new hybrid product, it is expected that they are less likely to use category markers when combining two emerging categories than when combining two mature categories. The above discussion leads to the following hypothesis:

Hypothesis 3: Organizations that produce a hybrid product and do not yet have a market share in any of the product categories that they combine are less likely to use any category markers when the two categories that are combined are both emerging compared to when the two categories are both mature.

In some situations the two categories combined in a hybrid product might not be equally developed. It could be that only one of the two categories is mature, with clearly identifiable category markers. In that situation, it is unclear whether or not organizations will decide only to use the clearly identifiable category markers of the mature category.

Moreover, using markers from the mature category and the emergent category – with the less-clear category markers – might create ambiguity and confuse consumers. This ambiguity might also be perceived when organizations decide to use only markers from the emergent category, with the less clearly identifiable markers. Not using clear markers might trigger consumers to become uncertain as to which category label should be applied or possibly trigger consumers to choose a “wrong” category in which the hybrid does not receive a favorable evaluation. Therefore, assuming that organizations do not have a market share in either of the categories, it was expected that organizations would use category markers of the mature category – instead of using category markers of the emergent category – to provide consumers with clues as to which category the hybrid product belongs.

Hypothesis 4: Organizations that produce a hybrid product that combines a product from a mature category with one from an emergent category, and do not yet have a market share in either the mature category or the emerging category are more likely to use the category markers of the mature category than of the emerging category.

3.3 Method

3.3.1 Sampling and data collection

Data was collected by means of structured interviews in which industrial designers were provided with five hypothetical scenarios. Designers were chosen as the representatives of the organization because they are often responsible for the ‘look and feel’ of a product. As designers decide, or at least strongly influence, what the product will look like – in terms of shapes, colors, or graphic elements – they also consciously or unconsciously decide on category markers.

The structured interviews followed a standardized script without deviation, similar to an online or phone survey. Although it is often easier to reach more respondents with (online) surveys, structured interviews were used in order to collect more data and more complex data (Biemer and Lyberg, 2003; De Leeuw and van der Zouwen, 1988), and to make sure that the respondents understood the concept of category markers and the different scenarios. Furthermore, the

structured interviews enhanced the quality of the data collected, as it enabled control over the data collection process and environment (Biemer and Lyberg, 2003; De Leeuw and van der Zouwen, 1988). The interviews were all conducted by the same interviewer to reduce interviewer-related error (Biemer and Lyberg, 2003; Fowler and Mangione, 1990).

The designers in the sample were selected from two large Dutch multinational organizations with separate design departments (56.3 per cent) and from four large design agencies (43.7 per cent) in the Netherlands. Designers from design agencies were included in the sample because small and medium enterprises often use external agencies for professional design activities (von Stamm, 1998). By interviewing both internal and external designers, a balanced sample of designers working for organizations that varied in size and market share was obtained. Whether or not the answers of internal and external designers differed significantly was determined, and it was found that they did not. The participating organizations were selected after consulting three academics in the field of new product design in the Netherlands, whom were asked to identify the most renowned and largest design agencies in the Netherlands and the largest Dutch multinational organizations that invest in design.

All of the selected producers (four design agencies and two multinational organizations) agreed to participate in this study. With the help of contact persons at the different organizations, designers at each organization were identified who were suitable for the purpose of this study; that is, those with experience in developing products and services. In total 119 designers were identified and contacted, of whom 71 agreed to participate (a response rate of 60%). The mean age of the respondents was 37.63 years (SD = 7.34), and the average work experience was 12.34 years (SD = 7.64). The design agencies provided an average of eight respondents per agency, and there were 20 respondents per multinational organization on average.

The interview consisted of three parts. In the first part the designers were asked demographic and background questions. In the second part the concept of category markers was introduced, by providing them with a definition and examples of category markers. Subsequently, designers were asked to indicate on a five-point Likert scale, the extent to which a concept category marker had a clear meaning to them (1 = to a very large extent, 5 = to a very small extent). As a final question in this part of the interview, they were asked to

provide examples of category markers from their personal work experience, and category markers of products in general. Only when the researchers were convinced that the designers understood the concept did they proceed with the interview. The final part consisted of the five different scenarios in which designers were given hypothetical cases in which they had to design a product that combined functionalities from two separate but unspecified categories.

3.3.2 Independent variables

In the five scenarios the designers were asked to design a hybrid product that would enhance market performance. Table 3.1 provides a list of these scenarios, including the scenarios to which the specific scenario was compared. The choice to compare a scenario of interest with another scenario was based on the element being tested. This element was the only aspect that differed between the two scenarios, in order to make the difference between the scenarios as small as possible. The scenarios were randomly ordered per respondent to minimize potential common method bias (Chang, Witteloostuijn, and Eden, 2010).

3.3.3 Dependent variables

The dependent variable was the decision of whether or not to use category markers, given one of the five scenarios. Table 3.1 shows the design decisions per scenario that the designers could choose from.

Table 3.1 Scenarios

Description	Design decisions	% that chose this decision	Compared with scenario
1 Organization combines functionalities from two mature product categories, and in one of those categories it has a large market share.	a) No markers	18.06%	2(H2), 3(H1)
	b) Markers from the category in which the organization had a large market share	54.17%	
	c) Markers from the category in which the organization has no market share	9.72%	
	d) Markers of both	18.06%	
2 Organization combines functionalities from a mature product category and a mature service category, and in the product category it has a large market share.	a) No markers	16.90%	1(H2)
	b) Markers from the product category	7.04%	
	c) Markers from the service category	26.76%	
	d) Markers of both	49.30%	
3 Organization combines functionalities from two mature product categories, and it has no market share in either category.	a) No markers	51.28%	1(H1), 4(H3), 5(H4)
	b) Markers of one category	20.51%	
	c) Markers of both categories	8.97%	
4 Organization combines functionalities from two emerging product categories, and it has no market share in either category.	a) No markers	81.69%	3(H3)
	b) Markers of one category	4.23%	
	c) Markers of both	14.08%	
5 Organization combines functionalities from one mature product category and one emerging product category, and it has no market share in either category.	a) No markers	45.21%	3(H4)
	b) Markers from the mature category	43.84%	
	c) Markers from the emerging category	6.85%	
	d) Markers of both	4.11%	

3.3.4 Control variables

This study controlled for work experience, and whether the designer worked at a design department or at a design agency. Research shows that novice and expert designers differ in how they use and apply their knowledge (Popovic, 2004; Cross, 2004). Designers can gain expertise by means of the number of years that they have been working as a designer and through the diversity of design assignments that they worked on. This might influence how designers identify and use category markers. Designers who work for a design agency are likely to work on a larger diversity of assignments. Therefore, whether the designer worked at a design department within an organization (internal designer) or for a design agency (external designer) was controlled for, next to the number of years of work experience.

3.4 Results

The concept of category markers was discussed with the designers to examine the validity of the concept. Of the 71 respondents, 93% indicated that they recognized the concept of category markers to some extent (7 per cent), to a large extent (50.7 per cent), or to a very large extent (42.3 per cent). There were no respondents who did not recognize the concept or who only recognized it to a small extent. All respondents were asked to provide one or two examples of category markers. Some respondents mentioned examples, such as the straight handlebar as a category marker for mountain bikes or the color red for mailboxes (at least in the UK and the Netherlands). Respondents also provided examples that related to packaging. For example, wine is normally found in a glass bottle and milk in a carton. Other examples mentioned included the differences between the furniture you find at the office versus home furniture, or the differences between the same product with different target groups (e.g. razor blades for men have a more robust look compared with those for women, which have a more curvy look).

Respondents showed a strong interest in the concept of category markers. This often resulted in an interesting discussion in which the respondents reflected on the role of category markers in their own daily work and the design decisions that they make. Some respondents mentioned that they used similar terms (such as industry codes, core

visuals, or elements of archetypes) during their daily work. Many respondents seemed to intuitively understand the concept of category markers because they automatically started to use this term in their own responses. When convinced that the respondents understood the concept, the interviewer continued to provide them with scenarios where they were asked to make a decision to use category markers.

Table 3.1 shows the percentage of designers who chose each option. In order to test the hypothesis, whether the relevant percentages differed across the scenarios was determined using binary logistic regression analysis. Two scenarios were compared, which resulted in an N of 142 per analysis. Only one control demonstrated a significant effect on designers' decisions to use category markers. In the scenario where designers were asked to combine a mature and an emerging category (see Table 3.5), a negative effect of designers' work experience on the decisions not to use any markers was found ($\beta = .05, p < .05$).

Table 3.2 shows the results for the first hypothesis. The results show that when designers were asked to combine functionalities of a product from a category in which the organization had a large market share, with those of a product from a category in which the organization did not have a market share, they were likely to choose category markers of the large-market share category ($\beta = 2.15, p < .01$). In addition, a negative significant effect of the conditions from this scenario on designers' decisions to use no markers was found ($\beta = -1.82, p < .01$). Therefore, Hypothesis 1 was supported.

Table 3.2 Effect on category marker use of combining mature categories in which the organization has a large market share in one of the categories (N = 142)

Variables	Category marker use							
	No markers		Markers from the category in which the organization has a large market share		Markers from the category in which the organization has no market share		Markers from both categories	
	<i>B</i>	S.E.	β	S.E.	<i>B</i>	S.E.	β	S.E.
Constant	.59	.45	-2.16	.54	-2.30	.68	-1.03	.47
Controls								
Internal vs external	-.20	.38	.48	.41	.03	.57	-.20	.40
Work experience	-.01	.03	-.01	.03	.01	.04	.02	.03
Scenario 1 ^a	-1.82**	.39	2.15**	.43	.00	.56	-.63	.40
χ^2 (d.f.)	24.90 (3)		31.40 (3)		.03 (3)		3.40 3(3)	
R^2	.22		.28		.00		.04	

^a Contrasted with Scenario 3

[†] $p < .10$, * $p < .05$, ** $p < .01$

Table 3.3 shows that when designers were asked to combine functionalities from a product through which the organization had a large market share and a service category in which it had no market share, they were likely to choose category markers of both the product and the service category ($\beta = 1.01$, $p < .05$). Some designers, however, were also likely to use only category markers from the service category ($\beta = 1.13$, $p < .05$). Therefore, Hypothesis 2 was partially supported.

Table 3.3 Effect on category marker use of combining a mature product category in which the organization has a large market share and a mature service category unfamiliar to the organization (N = 142)

Variables	Category marker use							
	No markers		Markers from product category		Markers from service category		Markers from both categories	
	<i>B</i>	S.E.	β	S.E.	β	S.E.	β	S.E.
Constant	-.88	.56	.11	.42	-2.25	.59	-1.69	.50
<i>Controls</i>								
Internal vs external	-.83	.53	.02	.36	.02	.45	.37	.39
Work experience	-.02	.04	.01	.02	.01	.03	-.01	.03
<i>Scenario</i>								
Scenario 2 ^a	-1.11*	.56	-1.07**	.35	1.13*	.48	1.01*	.40
χ^2 (d.f.)	7.05 (3)		9.55 (3)		6.07 (3)		7.83 (3)	
R^2	.01		.09		.07		.08	

^a Contrasted with Scenario 1

[†] $p < .10$, * $p < .05$, ** $p < .01$

As expected, designers were more likely to use no category markers when the combined categories were emerging compared with when they were mature (see Table 3.4). The log odds for the decision to use no markers is positively significant ($\beta = 1.21, p < .01$) in the scenario in which designers were asked to combine functionalities of products from two emerging categories. In addition, a negative effect of using category markers from both categories was found ($\beta = -.95, p < .01$), along with a marginally significant negative effect for using markers from only one category ($\beta = -1.20, p < .10$). Therefore, Hypothesis 2 was supported.

Table 3.4 Comparison of combining two mature versus two emergent categories on category marker use (N = 142)

Variables	Category marker use					
	No markers		Markers from one category		Markers from both categories	
	<i>B</i>	S.E.	β	S.E.	β	S.E.
Constant	.92	.45	-2.52	.73	-1.32	.50
<i>Controls</i>						
Internal vs external	-.29	.39	.08	.62	.26	.42
Work experience	-.04	.03	.04	.04	.02	.03
<i>Scenario</i>						
Scenario 4 ^a	1.21**	.40	-1.20 [†]	.69	-.95*	.43
χ^2 (d.f.)	12.57 (3)		4.62 (3)		6.28 (3)	
R^2	.12		.07		.07	

^a Contrasted with Scenario 3

[†] $p < .10$, * $p < .05$, ** $p < .01$

Table 3.5 shows a positive significant result for designers' decisions to use the category markers of the mature category when they were asked to combine functionalities from this mature category with an emerging category ($\beta = 1.80, p < .01$), given that the organization did not have a market share in either of the two categories. In addition, a negative significant result for designers' decisions to use category markers from both categories was found ($\beta = -2.26, p < .01$) Therefore, Hypothesis 3 was supported.

Table 3.5 Effect on category marker use of combining a mature and an emerging category (N = 142)

Variables	Category marker use							
	No markers		Markers from mature category		Markers from emerging category		Markers from both categories	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Constant	1.30	.44	-2.91	.60	-3.59	.87	-1.24	.55
<i>Controls</i>								
Internal vs external	-.54	.35	.46	.41	.92	.70	.10	.48
Work experience	-.05*	.02	.05 [†]	.03	.06	.04	.03	.03
<i>Scenario</i>								
Scenario 5 ^a	-.48	.35	1.80**	.44	-.38	.62	-2.26**	.65
χ^2 (d.f.)	9.80 (3)		24.15 (3)		4.53 (3)		18.63 (3)	
R ²	.09		.22		.07		.21	

^a Contrasted with Scenario 3

[†] $p < .10$, * $p < .05$, ** $p < .01$

3.5 Discussion

This research contributes to extant literature on categorization and hybrid products in several ways. In general, it introduces the concept of category markers and shows that designers recognize this concept as an object of design decision making. In terms of organizations' competitive positions, the results show that having a large market share in a product category strongly increases the likelihood that the category markers of that product will be used in the design of a hybrid of that product, with another product in which category the focal firm does not have a high market share. By doing this, the organizations signal that the new product belongs to a category that they already have a reputation in. This supports a resource-based perspective in terms of firms making product development decisions that leverage their core strengths (Helfat and Raubitschek, 2000).

The results also show that it plays a role in whether the hybrid consists of only product elements or elements from both a product and a service category. Many organizations combine or are starting to

combine services with their current products in PSS` (Santamaria et al., 2012; Ulaga and Reinartz, 2011). The results show, as hypothesized, that when organizations combine a high-market share product with a service in a PSS, they tend to use category markers from both the high-market share product and the service category. The results, however, also show that some organizations use only markers from the service category – even though their current competitive advantage is rooted in the product part of the PSS. A possible explanation for this could be that organizations want to highlight the uniqueness of this new offering; that is, they are adding a service to an existing product. As found in prior research, customers do not necessarily or automatically value combining a service element into a PSS (Ulaga and Reinartz, 2011). By emphasizing the service markers, consumers might be better able to judge the value of the service elements and perceive the uniqueness of the PSS.

Also as hypothesized, the results show that organizations are likely to use no category markers when the product categories combined in the hybrid product are emerging as opposed to mature. However, contrary to expectations, there is also a significant number of designers that decided to use no existing category markers when two mature categories were combined. The correlation coefficient was however, lower than when two emerging categories were combined, which is in line with the hypothesis. Preferring to apply no category markers in the case of a hybrid that combines two mature categories seems to be in line with prior research suggesting that once a product or industry reaches a state of maturity and demand stagnates, design innovation becomes important to differentiate from competitors (Eisenman, 2013; Gemser and Leenders, 2001). Refraining from using familiar category markers and trying to establish new ones could be seen as design innovation.

Finally, if the hybrid product combined characteristics from a mature category with those of an emergent category and the focal organization had no high market share in either of the separate original categories, the designers clearly opted, as hypothesized, for the category markers of the mature category. Particularly in combination with the observed disinclination to use category markers of both the mature and the emergent category, this suggests that the risk of categorical confusion, with its expected attendant decrease in evaluations, weighs heavier than the possible advantage of differentiation and newness signaling that could be achieved by also using the category markers of the emergent category.

3.5.1 Limitations and future research

Designers were interviewed to assess their use of category markers because they are, in general, responsible for designing product characteristics that fall under the definition of category markers. However, designers may not always be the people, or the only people, who make design decisions, including decisions with regards to category markers. A strict design brief, for example, may prevent or have an effect on how designers use category markers. An avenue for future research would be to interview other producer stakeholders about category marker usage. It would be particularly interesting to interview marketing managers as they are, similar to designers, in close contact with the market, and the relationship between design and marketing is in general 'an uneasy one' (Beverland, 2005; see also Beverland and Farrelly, 2011).

A second avenue for future research involves the study of product development projects, either retrospectively or in vivo. To collect data, hypothetical scenarios were used. Therefore, the data does not reflect decisions that designers made in real product development projects. However, the designers in this sample had, on average, more than 12 years of work experience and did not find it difficult to identify with the scenarios and make deliberate decisions about category markers.

A third avenue for future research would be to extend the study of category marker usage to different hypothetical scenarios. The research findings suggest, for example, that under certain circumstances producers may avoid using existing category markers; a further step would be to intentionally promote that the particular design characteristics offered by that firm are understood as new category markers. As speculated, this may be a result of producers wanting to distinguish themselves from competitors. It would be interesting to investigate the role of competition in greater depth, and when and why new categories emerge. A related topic is the determinants of the degree to which competing organizations follow design decisions regarding category markers that are made by organizations that are first to introduce a new product with new category markers.

3.5.2 Managerial implications

This study introduces and demonstrates the validity of the concept of category markers. The first managerial implication is that organizations should conduct extensive market research to identify the relevant

category markers of the categories they operate in or are planning to operate in. Misidentifying these markers can lead to unintentionally mis-positioning one's products, with negative effects on product performance.

A second managerial implication is that category markers can be used strategically to position new products in the market. The relevant actors involved in the new product development should be fully aware of this strategic function of category markers, in order to make effective design decisions. As the results show, these decisions are influenced by the market share of the organization and the level of maturity of the categories. Therefore, these factors should be accounted for by organizations, in order to make the correct strategic decisions about product positioning.

A third managerial implication is a new focus on the role of design within new product development (NPD) projects. Design professionals have emerged as skilled actors to support producers in NPD projects (Perks, Cooper, and Jones, 2005). Consciously or unconsciously, designers make strategic design decisions about when and which category markers to use in a new product design and these decisions can be considered important strategic positioning choices. Thus, as designers' activities regarding a product's 'look and feel' also influence how this product is going to be categorized, these activities may be more strategic than managers perceive.

3.5.3 Conclusion

This study introduces the concept of the category marker and is an initial attempt to examine how organizations strategically use category markers to position new hybrid products. It demonstrates that the use of these markers depends on the competitive context of the market and the competitive position of the organization. Most of the other studies that address new product design focus on the effect of design on members of the demand side of the market. This paper, on the other hand, discusses the function of design from the supply side of the market, and in a more general sense demonstrates how design can be used for strategic decisions.

Chapter 4

THE EFFECT OF CATEGORY LABELS ON
NEWNESS PERCEPTION AND
WILLINGNESS TO PAY AND THE
MODERATING ROLE OF CONSUMER
INNOVATIVENESS

Authors

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Abstract

This study examines the effect of category labeling on consumers' newness perception and willingness to pay. In addition, it examines the moderating role of consumer innovativeness and argues that consumer innovativeness positively moderates the effect of newness perception on willingness to pay, and the effect of using mature versus emerging category labels on willingness to pay. By conducting real online auctions in a field setting among consumers who pay for the product if their bid wins, and conducting a short survey among all bidders, this study demonstrates that consumer innovativeness moderates the effect of newness perception on willingness to pay for radically innovative products. In addition, providing an emerging category label positively affects consumers' newness perception and willingness to pay for innovative products. The results also show that consumer innovativeness positively moderates the effect of providing an emerging label on willingness to pay for innovative products. Significant results from category labeling of products that are incrementally innovative were not found. This study contributes to the categorization literature by demonstrating that providing category labels that differ in their degree of matureness can affect consumers' willingness to pay and their newness perceptions, and by demonstrating the moderating role of consumer innovativeness.

4.1 Introduction

Consumers use their knowledge from existing product categories to understand, compare, and value new products (Gregan-Paxton, and John, 1997; Moreau et al., 2001). To provide consumers with guidance about how a product can be categorized and understood, sellers often provide visual and textual category cues, for instance, when advertising the innovative product. A visual cue can, for example be symbols, forms, or colors. A textual cue can, for example, be slogans, descriptions of the functionalities of the product, and category labels. Communicating category labels stimulates consumers to transfer the knowledge that they have of the provided category to the target (Yamauchi and Markman, 2000). These category labels can provide explicit guidance to consumers in their categorization efforts and help consumers decide to which alternatives the product should be compared to in order to judge the value of the product (Mogilner et al., 2008). Category labels thus seem to be important category cues, which can have an effect on consumers' product evaluations. This phenomenon is the focus of this paper.

Category labels seem especially useful when how the product can be categorized is not directly obvious to consumers, which is often the case with radically innovative products. Radically innovative products have no dominant design yet (Utterback and Suarez, 1993; Srinivasan et al., 2006), and cannot be categorized in an existing product category because they are incongruent with consumers' expectations and existing knowledge (Stayman et al., 1992). This can have a negative effect on product evaluation (e.g., Noseworthy and Trudel, 2011). Next to helping consumers in their categorization efforts of radically innovative products, category labels can also signal or emphasize the newness of these products. Research shows that if consumers can categorize a new product, they are better able to judge the newness of a product, which positively influences product evaluation (Goode et al., 2013). This paper builds on this work by providing a refined view on the role that category labels play in consumers' newness perceptions and willingness to pay for radically innovative products.

Previous research argues that there could be multiple category labels in use for the same product category when this category is emerging (Grodal et al., 2014). Emerging categories tend to lack a dominant category label (Grodal et al., 2014). Therefore, when sellers of radically innovative products want to use a category label – for example

to advertise their product – they face the challenge of choosing between multiple category labels. In addition, as many radically innovative products combine elements from multiple existing product categories, sellers can choose between new and established category labels. Although there are studies that have examined the effect of providing category cues on consumers' categorization efforts and evaluation of new products (e.g. Goode et al., 2013; Bloch, 1995; Gregan-Paxton et al., 2005; Yamauchi and Markman, 2000), there are no studies that explicitly examine the effect of providing category labels on consumers' newness perceptions and willingness to pay for radically innovative products.

This paper studies the effect of providing category labels that differ in their degree of matureness on consumers' newness perceptions of radically innovative products. It argues that consumers' newness perception is positively influenced when labels refer them to an emerging category. In addition, whether or not labels affect consumers' willingness to pay is examined. Previous research argues that using familiar labels – for example, when advertising new products – is important for how consumers categorize and evaluate new products (Yamauchi and Markman, 2000). However, this paper argues that the fit between the degree of matureness between the label and the degree to which the product is innovative that is important for the effect on willingness to pay. Therefore, the effect of category labels that differ in their degree of matureness on the willingness to pay for both radically and incrementally innovative products is tested. Finally, the moderating role of consumer innovativeness (i.e. consumers' tendencies to buy new products more often and earlier than others) is examined (Midgley and Dowling, 1978). Individual characteristics – such as consumer innovativeness – are often ignored in studies of the effect of categorization on product evaluation. This paper argues that consumers are generally willing to pay a higher price if they perceive a product as new, and that consumers who score high on consumer innovativeness are willing to pay a 'newness premium' on top of that.

By conducting 'real' online auctions – that is, online auctions in which consumers pay with their money if they win an auction – and conducting a short survey, this study demonstrated that consumer innovativeness moderates the effect of newness perception on willingness to pay for innovative products. In addition, providing an emerging category label compared to a mature category label positively affects consumers' newness perception and willingness to pay for radically innovative products. The results also show that consumer

innovativeness positively moderates the effect of providing an emerging category label on willingness to pay for radically innovative products. Significant results from category labeling in relation to an incrementally innovative product were not found.

This study contributes to literature on categorization in several ways. First, it demonstrates that category labeling has a different effect depending on the degree to which a product is innovative. The results were only significant for the effect of category labeling in the case of a radically innovative product and not of an incrementally innovative product. This suggests that category labeling plays a stronger role in the case of radically innovative products. Second, consumer innovativeness plays an important moderating role in the relation of newness perception and category labeling on willingness to pay for radically innovative products. Therefore, evidence is provided that consumers who are interested in innovation are willing to pay a ‘newness premium’.

This paper continues with a review of the relevant literature on consumer innovativeness and the effects of categorization and category labeling on newness perception and willingness to pay. On the basis of this review hypotheses are formulated, followed by a discussion of three studies in which we present the methods and results. This paper is completed with a discussion of theoretical and managerial implications.

4.2 Theory

4.2.1 Categorization

Consumers often use their knowledge of existing product categories to determine the value of products (Gregan-Paxton, and John, 1997; Moreau et al., 2001). Categorization is the process of identifying the similarities among alternatives within a category and identifying the dissimilarities among alternatives across categories (Medin and Schaeffer 1978; Rosch and Mervis 1975). By comparing the product to prototypes of a category that they are already familiar with, consumers try to understand new products (Rindova and Petkova, 2007; Talke et al., 2009). Previous research has demonstrated that when consumers cannot easily categorize a product, that product’s evaluation is negatively affected (e.g., Noseworthy and Trudel, 2011). Once a product is categorized, consumers attempt to judge how different the product is

from the alternatives in that category (Yamauchi and Markman 2000). The way that consumers categorize the product and subsequently judge how it differs from alternatives is important for their evaluation of the product. Their efforts to categorize and identify the similarities and differences are guided by the different category cues of a product or the cues that are provided along with the product (Goode et al., 2013). An example of a cue that is often provided along with the product is a category label, which is the core element studied in this paper.

4.2.2 Category labels

To guide consumers in their categorization efforts, sellers can use category labels – for example when advertising their innovative products. When sellers propose a category for a product, for example by communicating the category label, consumers try to identify the similarities between the alternatives in the proposed category and the product (Yamauchi and Markman 2000). The product is categorized in the proposed category when sufficient similarities are identified and the category label is deemed acceptable. Therefore, using acceptable category labels can help consumers make sense of products, especially innovative products. Yamauchi and Markman (2000) showed that category labels are more important for consumers to make sense of innovative products than other information (such as features and shape) that reveals the similarity of innovative products with alternatives in a particular category. In general, category labels seem to be important and useful elements that sellers can use to guide consumers in their categorization efforts.

4.2.3 Emerging categories

As categories and their associated labels are socially constructed, they can differ in the degree to which they are mature (Rosa et al., 1999). Emerging categories tend to have low consensus about the core attributes that represent that category (Rosa et al., 1999), since no dominant design of the product has been established (Utterback and Suarez, 1993; Srinivasan et al., 2006). When there is no dominant design the core functionalities of the products within a category substantially differ across the products in that category (Utterback and Suarez, 1993).

Next to a lack of consensus on the functionalities of products in an emerging category, there might also be a lack of consensus about which category label can be assigned to the products in an emerging product category.

Radically innovative products are often characterized by the fact that they combine elements from multiple categories (Moreau et al., 2001). If this is the case, sellers have the opportunity to choose between different category labels (Grodal et al., 2014). On the other hand, sellers have less freedom in their decisions about which category label to provide when the product is incrementally innovative. These products – in contrast to radically innovative products – tend to reveal (e.g. by means of the visual appearance or mentioned functionalities) the category membership of the product. This limits the seller in the number of acceptable category labels that can be used. However, in the case of radically innovative products – of which the visual appearance and functionalities tend to be different from existing products – sellers have more freedom to assign less well established category labels to indicate that the product belongs to a new product category. Moreover, when categories are emerging, the number of multiple category labels that are introduced often increases rapidly (Grodal et al., 2014). Proposing category labels can be used as cues to indicate which category the products can be assigned to, and it may also have an effect on the newness perception of products.

4.2.4 Newness perception

Consumers' newness perception of a radical innovative product can be influenced by how they categorize the product. Consumer newness perception is not an objective value; rather, it differs per individual (e.g., Blythe, 1999; Goode et al., 2013; Hauser, Tellis, and Griffin, 2006). In line with previous research, we define newness perception as the degree to which a product is new to the individual (e.g. Blythe, 1999; Goode et al., 2013). In general, two important factors related to categorization play a role in consumers' identification of the newness of a product. First, when confronted with a product, consumers will use available category cues – such as perceived functionalities and visual appearance – to identify the category membership of the new product (Goode et al., 2013). Since categories differ in their degree of matureness, consumers' newness perception can be influenced by the category in which the

product is perceived to belong to, relative to other categories (e.g. the category of smartphones is newer to the market compared to the category of fax machines).

Second, once a category is identified, consumers will carefully try to identify similarities between the innovative product and the alternatives in that category (Danneels and Kleinschmidt, 2001; Hoeffler, 2003; Ziamou and Ratneshwar, 2003; Olshavsky and Spreng, 1996). Consequently, consumers' newness perception will be influenced by the degree to which an innovative product is perceived as different from the alternatives within a category (Radford and Bloch, 2011). To summarize, newness perceptions are constructed by the degree to which the category in which consumers place the product is new compared to other categories, and by the degree to which consumers perceive the innovative product as different than the alternatives within a category.

4.2.5 Newness perception and evaluation

Previous research argues that product newness can influence consumer behavior but that there is no consensus among scholars about whether product newness elicits higher product evaluations (Calantone, Chan, and Cui, 2006; Lee and O'Connor, 2003; Szymanski, Kroff, and Troy, 2007). Some studies show that consumers appreciate product newness (e.g. Danneels and Kleinschmidt, 2001; Firth and Narayanan, 1996), while others demonstrate negative effects on product evaluation (e.g. Song and Parry, 1999). Studies also describe a 'U-shaped' relationship between product newness and performance (Kleinschmidt and Cooper, 1991), in which products that score either high or low on newness perform better. The idea behind this U-shape is that radically innovative products can create a competitive advantage and allow for better differentiation between alternatives, which might have a positive effect on product evaluation. Conversely, products that are perceived as less innovative might be perceived as more familiar and cause less uncertainty, which may have a positive effect on product evaluation.

Despite the identified different effects of product newness on product evaluation, previous studies show that consumers tend to demonstrate inherent novelty seeking behavior and value newness (Bloch, 1995; Hirschman, 1980; Moreau and Dahl, 2005). In addition, providing consumers with knowledge about innovative products – for example by providing a description, a category label, or visuals – has a

positive effect on consumers' evaluations of those innovative products (Moreau et al., 2001). Particularly when consumers can categorize a product with certainty, they value the newness of the product (Goode et al., 2013). Thus, in line with previous research it was expected that consumers' newness perception would have a positive effect on their evaluation of the product (Danneels and Kleinschmidt, 2001; Firth and Narayanan, 1996; Moreau and Dahl, 2005). However, the effect might differ per person since some consumers are more attracted to innovation than others (e.g., Blythe, 1999; Goode et al., 2013; Hauser et al., 2006).

4.2.6 Consumer innovativeness

Previous research has extensively studied how consumers differ in the degree to which they appreciate innovation (e.g. Goldsmith, Freiden, and Eastman, 1995; Goldsmith, Hauteville, and Flynn, 1998; Midgley and Dowling, 1993). This line of research argues that consumer innovativeness can be seen as a personality trait, and that consumers differ in their openness to innovation. Research shows that this openness is important for the adoption and diffusion of new products (Hauser, Tellis, and Griffin, 2006). In line with the previous literature, consumer innovativeness is defined in this paper as the tendency of consumers to buy new and innovative products more often and more quickly than other consumers (Roehrich, 2004; Vandecasteele, and Geuens, 2010).

Previous studies have demonstrated that – in general – consumer innovativeness positively influences new product evaluations (e.g. Im, Bayus, and Mason, 2003; Klink and Athaide, 2010; Foxall, 1995; Goldsmith et al. 1995; Manning, Bearden, and Madden, 1995; Midgley and Dowling, 1993). Midgley and Dowling (1993), for example, found that in the fashion industry consumer innovativeness was positively related to purchase intention of new fashion items. In addition, in the software industry, consumer innovativeness had a positive influence on new product adoption (Foxall, 1995). Klink and Athaide (2010) found that consumer innovativeness was positively related to product evaluations of products with new brand names. Given the positive effect of both consumer innovativeness and the previously discussed positive effect of newness perception on product evaluation, it was expected that

consumer innovativeness would positively moderate the effect of newness perception on consumers' willingness to pay.

Hypothesis 1: Consumer innovativeness positively moderates the positive effect of newness perception on willingness to pay.

4.2.7 Category labels and newness

As mentioned earlier, categories can vary in their degree of matureness. In the case of emerging categories, boundaries are not fully established yet (Rosa et al., 1999). As the boundaries are less clear – and the features (e.g. functionalities and visual appearance) that belong to the products in those categories – consumers perceive fewer similarities between the alternatives in those categories. Consequently, products that are perceived as belonging to emerging categories may also be perceived as newer than products that are categorized in mature categories.

Next to functionalities and visual appearance, category labels can act as a cue as to which category a product belongs to, and can thus influence consumers' newness perceptions. Category labels can influence consumers' newness perceptions in several ways. First, when a label from an emerging category is provided and consumers perceive it as an acceptable label consumers' newness perception can be positively influenced. Second, the label can also act as a 'newness cue' because consumers might not be familiar with the specific category label. However, such a new label should be sufficiently comprehensible, and distinctive enough to signal the novelty of the underlying product (Grodal et al., 2014).

It was expected that in the case of radical innovative products, providing an appropriate category label for an emerging category compared to a label for a mature category would increase consumers' newness perception of the product.

Hypothesis 2: Compared to providing a mature category label, providing an emerging category label leads to a higher newness perception of a radically innovative product.

4.2.8 Category labels and evaluation

In addition to helping consumers categorize the product, category labels influence consumers' newness perceptions. As discussed previously, perceived newness has a positive effect on consumers' product evaluation. Therefore, when providing a label from an emerging category, it was expected that this would have a positive effect on consumers' willingness to pay. However, it was expected that this would only be the case if the label was sufficiently comprehensible (Grodal et al., 2014) and if the label was perceived as appropriate. Regarding the latter, this paper argues that a category label is not appropriate if it is not in line with the degree of innovativeness of the product. In other words, if a product is radically innovative but a label from a mature product category is provided, there may be a lack of perceived congruity. Previous research demonstrates that perceived incongruity can have a negative effect on product evaluation (Noseworthy and Trudel, 2011; Meyers-Levy and Tybout 1989). Thus, it was expected that consumers' willingness to pay for a radically innovative product would increase when a category label from an emerging category compared to a mature category was provided. In addition, it was expected that providing a category label from an emerging category would have a negative effect on consumers' willingness to pay in the case of an incrementally innovative product. This led to the following hypotheses:

Hypothesis 3a: Compared to providing a mature category label, providing an emerging category label leads to a higher willingness to pay for a radically innovative product.

Hypothesis 3b: Compared to providing a mature category label, providing an emerging category label leads to a lower willingness to pay for an incrementally innovative product.

It was expected that these two hypothesized effects would be moderated by the degree to which consumers are innovative. Research shows that consumer innovativeness is positively related to consumers' evaluations of new products (Im et al., 2003; Klink and Athaide, 2010). Therefore, it was expected that consumers who scored high on consumer innovativeness would be willing to pay extra if an emerging label was used in combination with an innovative product. In this case, they would receive multiple 'newness cues' from the provided category

label and the product, which could be appealing to consumers who appreciate innovation.

Hypothesis 4a: Consumer innovativeness reinforces the positive effect of providing an emerging category label compared to a mature category label on consumers' willingness to pay for a radically innovative product.

On the other hand, if an emerging category label was provided along with an incrementally innovative product, it was expected that this would have negative consequences on product evaluation among innovative consumers. Those consumers might be disappointed when the label suggests that the product is new while that is not the case, which negatively influences product evaluation. In addition, sellers who use emerging category labels when selling a product from a mature category might be mistrusted because consumers might feel that those sellers are trying to fool them. This leads to the following hypothesis:

Hypothesis 4b: Consumer innovativeness reinforces the negative effect of providing an emerging category label compared to a mature category label on consumers' willingness to pay for an incrementally innovative product.

4.3 Method

In all three studies, an online auction was conducted using a platform that combined a sealed bid n th price auction with a short survey tool. In the real auction, respondents placed one sealed bid that others could not see and subsequently answered questions. This online research platform was developed by the authors. Two important elements of the auctions are that they are not conducted in a laboratory but take place in a field setting, and that the auctions are 'real', which means that consumers pay for the product if their bid is the winning one.

The winners of the auction pay an amount that is always equal to a bid lower than their own bid. This is similar to the random n th-price auction (see Shogren et al., 2001), in which all bidders who placed a bid higher than the randomly selected n th-bid win the auction but pay the n th-bid. This auction, however, differs in the sense that the n th-bid is not randomly assigned but determined by the researchers, making this

auction a ‘non-random n th-price auction’. To make the auction more comparable with real purchase situations for bidders, an (secret) auction price of around 20% below the normal retail price of the products was selected.

4.3.1 Consumer panel

Panel members were recruited from two existing panel agencies. The members of those agencies were asked to sign up at the auction website in return for a number of points that they collect at those panel agencies. Those points can be exchanged for products or coupons. Once these members signed up on the website they became part of the panel. In addition, panel members were recruited by master students of business who sourced their networks. In contrast to the panel agencies, participants in these auctions did not receive an incentive (e.g. points or money) for their participation. In total over 5000 panel members were recruited, of which approximately 1800 became ‘active’ (i.e. respondents who participated in at least one auction in the last 30 days). In these three studies, only ‘active’ panel members were invited for two reasons. First, demographics (such as gender, age, and education) information was already gathered for the active panel members. Second, the active panel members were familiar with this type of auction. The average age of the active panel members was 42 years, and on average 51% of them were female. 62% indicated that they were highly educated (i.e. Bachelor degree or higher). 24% of the panel consisted of both bachelor and master students.

4.3.2 Procedure

Respondents were invited by email. By clicking on the link in the invitation email respondents were directed to the auction website. Respondents were able to participate in the auction after clicking the link within 12 hours. Before showing the advertisement, respondents had to agree that: 1) they could place only one bid, 2) their bid was legally binding, 3) their bid included tax and shipping cost, and 4) winners had to pay within 48 hours after receiving the invoice. The respondents were furthermore informed that within one week after their payment the winner would receive the product. In addition, the closing date and time of the auction was mentioned. By clicking ‘continue’ they agreed to the rules and the advertisement was shown.

Respondents could place their bid in a field below the advertisement. After confirming their bid they were asked to fill out the survey questions. They could end their participation by clicking ‘complete participation’. Upon closing the auction, the respondents received an email with the outcome of the auction. The email to the winner mentioned his or her bid amount and the amount that he or she had to pay. The payment details were also provided. The respondents who did not win the auction received an email that mentioned the amount that they bid and the amount that the winner had to pay.

4.4 Study 1

In Study 1 the first hypothesis was tested, examining the moderating effect of consumer innovativeness on the positive effect of newness perception on willingness to pay. Demonstrating the moderating effect of consumer innovativeness is a necessary first step for the rest of the studies in which this consumer characteristic also plays a role.

4.4.1 Method

Respondents

The respondents in this study were part of the consumer panel attached to the auction platform. In study 1, a total of 600 active respondents were randomly invited from the consumer panel by email. In this auction a total of 203 respondents participated (response rate of 34%) by placing a bid and answering all of the survey questions. The average age of the participating respondents was 42 years, and 48% of them were female.

Auction product

In Study 1, an innovative herb garden in which people could grow their own herbs with little effort was auctioned off. The growth medium – including automatic and adjustable LED light and ‘Smart soil’ – had sensors to track the herbs and will take care that the herbs will get the right amount of light, water, and nutrients. As this product was new to the market at the time of the auction, most of the respondents were not

familiar with it. The advertisement in the auction showed an image of the product, accompanied by a description of the functionalities.

Independent variables

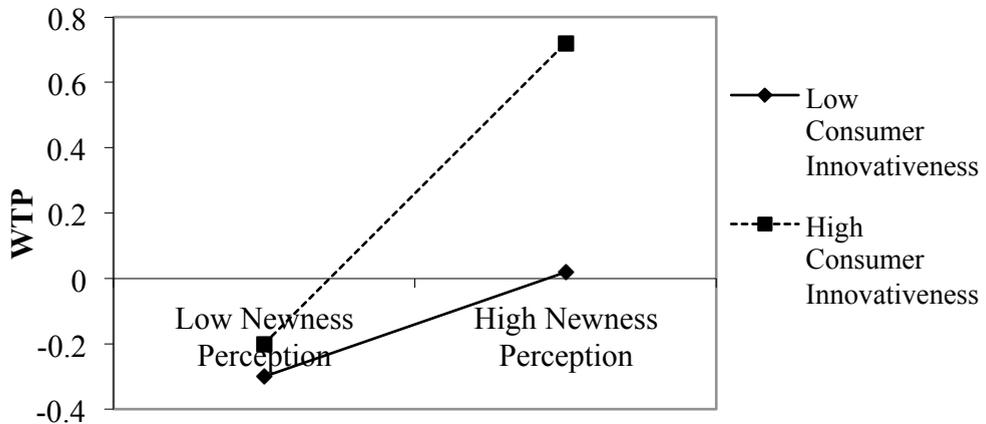
Respondents' newness perceptions were measured using a 5-point scale in which they were asked to indicate whether they thought the product was new or not new, innovative or not innovative, and original or not original ($\alpha = .88$; adapted from Goode et al., 2013). The respondents' demographics were already known because all of them participated in at least one auction before participating in this auction.

Consumers innovativeness was measured using a 4 item 5-point (1 = *Strongly disagree*, 5 = *Strongly agree*) scale ($\alpha = .78$; adapted from Roehrich, 2004) that provided statements about the extent to which consumers were attracted to innovative products (statements: "I am interested in innovative products", "I like to buy new and innovative products", "I am usually among of the first to try new products", and "In general, I am more aware of new products than the people around me").

4.4.2 Results

A regression analysis was conducted to measure the interaction effect of the standardized coefficients between consumers' newness perceptions and innovativeness on willingness to pay. The results show a significant direct effect of both newness perception ($\beta = .30$, $t(204) = 4.15$, $p < .01$) and consumer innovativeness ($\beta = .17$, $t(204) = 2.43$, $p < .05$) on consumers' willingness to pay. Consistent with the first hypothesis, the results revealed a positive interaction effect between consumers' newness perceptions and innovativeness on willingness to pay ($\beta = .15$, $t(204) = 2.11$, $p < .05$; figure 4.1). A simple slope analysis (Aiken and West 1991) was also conducted to interpret the interaction effect (see figure 4.1). This demonstrates that the slopes significantly differed ($t = 2.63$, $p < .01$), thus supporting Hypothesis 1.

Figure 4.1 Moderating role of consumer innovativeness on the effect of newness perception on willingness to pay (standardized coefficients)



4.4.3 Discussion

In Study 1, a strong effect of both consumers' newness perceptions and consumer innovativeness on consumers' willingness to pay for the auctioned off product was found. This might be explained by the relatively high mean of consumers' newness perceptions of the product ($m = 4.12$). Study 1 demonstrates that consumers who score high on innovativeness are willing to pay a 'newness premium'. This is in line with previous research that argues that consumers' might differ in how they value newness (e.g. Goldsmith, Freiden, and Eastman, 1995; Goldsmith, Hauteville, and Flynn, 1998; Midgley and Dowling, 1993). Study 2 builds on this result by first examining whether or not category labels influence consumers newness perception and willingness to pay. Second, whether or not the effect of providing category labels on willingness to pay is moderated by consumers' innovativeness is discussed.

4.5 Study 2

The aim of this study was to examine the effect of category labels on consumers' newness perceptions of an innovative product and their

willingness to pay for this product. In addition, whether or not consumer innovativeness moderates this latter relationship was examined. Study 1 was also replicated to show additional support for the first hypothesis.

4.5.1 Methods

The methods we used were similar to Study 1, except that an experimental setup was added. Instead of using one advertisement two were used. The respondents were randomly assigned to one of the two advertisements. Similar to Study 1, respondents placed one sealed bid that others could not see and subsequently answered questions.

Respondents and procedure

The respondents of the experiments in this study were part of the consumer panel that was attached to the auction platform. For this experiment, a total of 800 active respondents from the consumer panel were invited through email. A total of 378 respondents participated (response rate of 47%) by placing a bid and answering the survey questions. The average age of the participating respondents in this first experiment was 42 years and 48% were female. The procedure of this study was the same as that in Study 1.

Auction product

In this study a radically innovative product was auctioned off. By means of a pre-test among 57 respondents, the perceived innovativeness of three radically innovative products (the means were $m = 3.43$, $m = 3.62$, and $m = 3.90$) was measured on a 5 point Likert scale. The product that scored the highest on innovativeness was used in this study. This product was a hand-held device that could identify the nutrients in food by means of a spectrometer. Upon scanning food with the spectrometer, the device sends the data through a smartphone to a database. Subsequently, results are shown on a smartphone app related to, for example, calories, fat, protein, and carbohydrates.

In the experimental auctions a 1 x 2 experimental design was used, in which two advertisements were tested. In the first advertisement a category label of a mature category was provided (i.e.

'calorie counter'). Currently, there has been an increase in products that enter the market that are (wirelessly) connected to the internet (e.g. smart watches, and light bulbs that can be operated with a smartphone). The products in this emerging category are often called 'smart products'. To guide consumers towards an emerging category the word 'smart' was used in the category labels. Thus, for the second advertisement the category label 'smart food analyzer' was provided. In a pre-test among 57 respondents, 79% of the respondents indicated the chosen emerging category label as more appropriate for the auctioned-off product compared to the chosen mature category label.

Independent variables

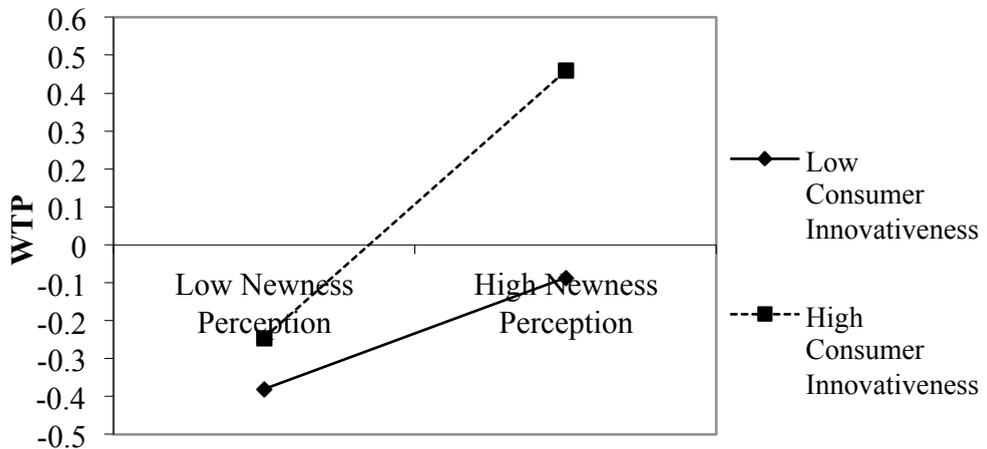
The independent variables 'newness perception' ($\alpha = .89$) and 'consumer innovativeness' ($\alpha = .84$) were measured in the same manner as in Study 1.

4.5.2 Results

Moderating role of consumer innovativeness

A regression analysis revealed a positive interaction effect between consumers' newness perceptions and consumer innovativeness on willingness to pay ($\beta = .103$, $t(290) = 2.21$, $p < .05$). The simple slope analysis (see Figure 4.2) shows that the slopes significantly differed ($t = 2.54$, $p < .05$), providing additional support for Hypothesis 1.

Figure 4.2 Moderating role of consumer innovativeness on the effect of newness perception on willingness to pay (standardized coefficients)



Effect of category labeling on newness perception

Table 4.1 shows the summary statistics of the experimental data. A one-way between-subjects ANOVA was conducted to test the effect of providing a mature category label versus an emerging category label on consumers' newness perceptions. The prediction was that in the case of a radically new product, consumers would have a higher newness perception when providing a category label of an emerging category versus a mature category. Although only marginally, the results show that this is indeed the case ($F(1, 378) = 2.98, p < .10$). Thus, these findings support the second hypothesis.

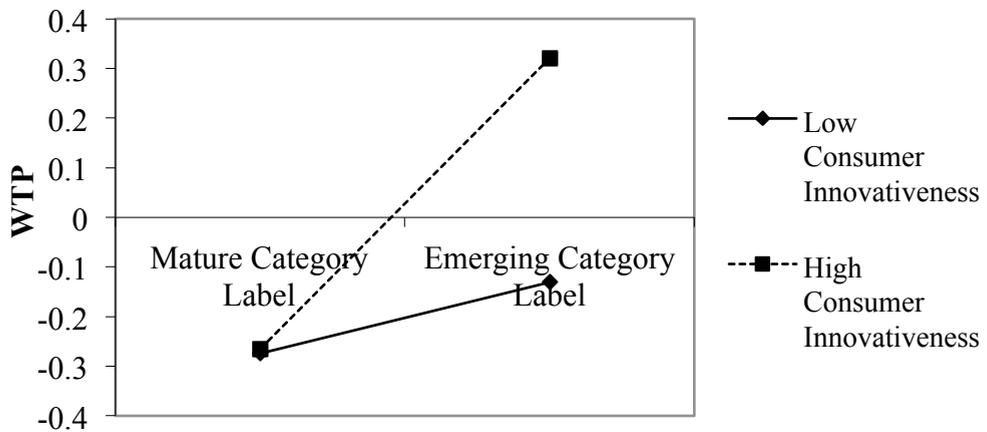
Table 4.1 Newness perception and willingness to pay per advertisement

Treatment	Newness perception		Willingness to pay	
	<i>N</i>	<i>Mean (S.D.)</i>	<i>N</i>	<i>Mean (S.D.)</i>
Label from mature category	185	4.10 (0.92)	219	7.92 (11.11)
Label from emerging category	193	4.26 (0.79)	215	12.63 (21.85)
All treatments	378	4.18 (0.86)	434	10.26 (17.42)

Effect of newness perception on willingness to pay and the moderating role of consumer innovativeness

An ANOVA showed that providing an emerging category label compared to a mature label has a positive effect on consumer willingness to pay ($F(1, 434) = 8.05, p < .01$), which supports Hypothesis 3a. In addition, it was expected that consumer innovativeness positively moderates this effect. To test whether consumers who score high on consumer innovativeness are indeed willing to pay a ‘newness premium’ when an emerging category label is provided, an ANOVA was conducted that included the interaction between consumer innovativeness and providing a mature versus emerging category label. As expected, a positive significant interaction effect ($F(1, 310) = 5.80, p < .01$) indicated that consumer innovativeness does have an effect on consumers’ willingness to pay a ‘newness premium’ when an emerging category label is provided. A simple slope analysis shows that the slopes significantly differ ($t = 2.99, p < .01$; see Figure 4.3), thus supporting Hypothesis 4a.

Figure 4.3 Moderating role of consumer innovativeness on the effect of a label on willingness to pay (standardized coefficients)



4.5.3 Discussion

These analyses show that providing a mature category label versus an emerging category label had an effect on consumers' newness perception and willingness to pay. The effect on consumers' willingness to pay was more significant than the effect on consumers' newness perceptions. A possible explanation for this could be the novelty of the product. Product characteristics – such as visual appearance and functionalities – may have strongly influenced consumers' newness perceptions, diminishing the effect of the category label on newness perceptions. Nonetheless, the category label did have an effect, which provided support for the fact that category labels can be newness cues in the case of radically innovative products.

Based on the results in this study it seems that consumers appreciate when the level of innovativeness of the provided category label matches the level of innovativeness of the product, and that consumers who are attracted to innovation appreciate this even more. To find further evidence that supports the assumption that this perceived fit is important, and an incrementally innovative product was used in the third study.

4.6 Study 3

In Study 2 a positive effect of the emerging label on willingness to pay for a radical innovative product was found. In Study 3, it was expected that providing an emerging category label when offering an, incrementally innovative products would have a negative effect on willingness to pay, due to the lack of fit and the fact that this effect is reinforced by the degree to which consumers are attracted by innovation. In addition, the robustness of the effects from the first study (i.e. the moderating role of consumer innovativeness on the effect of newness on willingness to pay) was further examined.

4.6.1 Method

The method that was used was similar to the experimental auction setup used in Study 2. The only difference was that a non-innovative product was used instead of an innovative product.

Respondents and procedure

For this experiment, a total of 800 active respondents were invited through email. A total of 303 respondents participated (response rate of 38%) by placing a bid and answering the survey questions. The average age of the participating respondents in this experiment was 43 years, and 47% were female. The procedure of this study was the same as that in Studies 1 and 2.

Auction product

This study auctioned off a non-innovative product. Through a pre-test with 57 respondents, the perceived innovativeness of three incrementally innovative products were measured on a 5 point Likert scale (the means were $m = 1.69$, $m = 1.96$, and $m = 2.22$). The product that scored the lowest on innovativeness was used in this study. This product was a set of three plastic cutting boards. Each cutting board had a different symbol – that could be used as an index –allowing the user to quickly see if the cutting board is used for cutting meat, fish, or vegetables.

In the experimental auctions a 1 x 2 experimental design was used, in which two advertisements were tested. In the first advertisement, a category label of a mature category was provided (i.e. 'plastic cutting boards'). For the emerging category label we use the word 'smart' – which is in line with the second study – to guide consumers towards an emerging category (i.e. the category of smart products). The word smart was combined with the index system of the cutting boards, which resulted in the category label 'smart index cutting boards'. In a pre-test among 57 respondents, 94% of the respondents indicated that the chosen mature category label was more appropriate for the auctioned-off product than the chosen emerging category label.

Independent variables

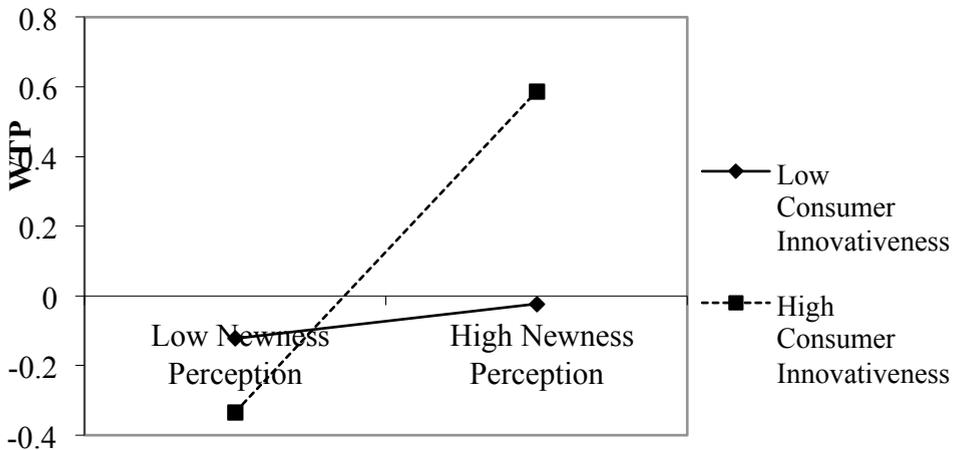
The independent variables newness perception ($\alpha = .85$) and consumer innovativeness ($\alpha = .84$) were measured in the same manner as in Studies 1 and 2.

4.6.2 Results

Moderating role of consumer innovativeness

A regression analysis revealed a positive interaction effect between consumers' newness perceptions and consumer innovativeness on willingness to pay ($\beta = .204$, $t(210) = 3.258$, $p < .01$). The simple slope analysis (see 4.4) show that the slopes significantly differed ($t = 3.70$, $p < .01$), supporting Hypothesis 1.

Figure 4.4 Moderating role of consumer innovativeness on the effect of newness perception on willingness to pay (standardized coefficients)



Effect of newness perception on willingness to pay and the moderating role of consumer innovativeness

A one-way between-subjects ANOVA showed that an emerging category label generated a lower willingness to pay than a mature category label, but this effect was not significant ($F(1, 303) = 0.10, p = .74$). It was expected that consumers would want to pay less when providing a category label of an emerging category versus a mature category. As the ANOVA did not reveal a significant result it does not support Hypothesis 3b. It was also expected that consumer innovativeness would negatively moderate this effect. A significant moderation effect was not found in this case either. Thus, these results do not support Hypothesis 4b.

4.6.3 Discussion

The results of this third study suggest that in the case of a non-innovative product, providing category labels does not have a significant effect on the value perception of consumers. This might be due to the fact that consumers in general quickly understand non-innovative

products through the visual appearance of these products. If a product is easy to understand, providing additional information might have no effect or a weaker effect than products that are not easy to understand through their visual appearance.

4.7 General discussion

This paper examines the effect of providing category labels for consumers' newness perceptions and willingness to pay, and the moderating role of consumer innovativeness. It builds on studies that have examined the effect of category cues on consumers' understanding and evaluation of innovative products. This study highlights the importance of category labels in relation to both the degree to which the product is innovative and the degree to which consumers are attracted to innovation. Compared to previous research, this paper shows a more refined view by demonstrating that providing an emerging category label, compared to a mature category label, in combination with an innovative product positively affects newness perception and product evaluation of innovative products. In addition, these results show that the degree to which consumers are attracted to innovation strengthens the latter effect. Moreover, consumer innovativeness strongly moderates the positive effect of newness perception on willingness to pay.

This study contributes to literature on the effect of categorization and category cues on consumer behavior in several ways. First, it examines the effect of providing category labels from categories that differ in their degree of maturity. Previous research indicates that categories can differ in how mature they are (e.g. Rosa et al., 1999), especially if categories are emerging and multiple category labels are used (Grodal et al., 2014), and no dominant category label has emerged. However, there are no studies that have explicitly examined whether or not providing category labels of emerging categories influence consumers' newness perception and product evaluation. This paper addresses this gap by theorizing and demonstrating that category labels that differ in their degree of maturity can influence consumer behavior. Second, the moderating effects of consumer innovativeness in combination with the effects of categorization were explored. Previous research indicates that consumers can differ in the degree to which they are attracted to innovative products (e.g. Goldsmith et al., 1995;

Goldsmith et al., 1998; Midgley and Dowling, 1993). However, studies on the moderating role of consumer innovativeness are scarce. This study demonstrates that consumer innovativeness moderates the effect of providing category labels that differ in their degree of matureness on consumers' willingness to pay.

Contrary to expectations, an effect of category labeling on newness perception and product evaluation in the case of incrementally innovative products was not found. These types of products often have enough cues to reveal the category membership of a product. Thus, providing an additional cue might not have a strong effect on consumers' perceptions of the product. Indeed, prior literature has demonstrated that consumers' expertise, involvement, and familiarity with a product or product category can affect how they use and are influenced by information (e.g., Chocarro, Elorz, and Miguel, 2012; Kuusela, Spence, and Kanto, 1998). In the case of a radically innovative product, the available category cues (e.g. category labels) – and additional information gathering – might play a more important role in the process of making sense of the products, which could explain why significant effects were only found in the case of a radically innovative product.

4.7.1 Limitations and future research

This study has several limitations. It only tested one emerging and one mature category label per product. Although these labels were pre-tested, the researchers could have chosen many more, particularly for the innovative product more labels were available, as is often the case with emerging categories (Grodal et al., 2014). In general, category labels refer to a specific category, but the word(s) used for the label might also have a meaning that can influence consumers' perception. For example, the word 'smart' was used to refer to the category of products that are connected to the internet, but the word smart also means clever. As this can be perceived as something positive, this might have evoked positive emotions and affected consumers' perceptions of the product. Future research could focus on testing a larger number of available category labels.

Future research could also investigate the effect of different types of emerging category labels on newness perception and evaluation. Grodal et al. (2014) discussed that labels can be created through

compounding, derivation, or completely anew. The term compounding means that a category label is created by combining two or more words (e.g. smartphone). Derivation is the transformation of an existing word (e.g. computer is derived from to compute). Completely new labels have no links to an existing word or category. It would be interesting to see the effect on consumers' newness perception and willingness to pay of these different types of category labels, and how this differs based on the degree of consumer innovativeness. For example, consumers who score high on consumer innovativeness might be attracted to completely new labels, and consumers who are not innovative may be attracted to labels that are created through compounding.

This study only addressed one classification level. Classification systems often consist of multiple hierarchical levels, including subordinate and superordinate categories (e.g. a blender is a subordinate category of the superordinate category kitchen appliances). It would be interesting to further explore whether these different levels have a different outcome on consumers' newness perception and evaluation. Superordinate categories are often more familiar to consumers because they have been around longer than subordinate categories. Because consumers are often better able to judge the newness of a product if they can clearly categorize it (Goode et al., 2013), providing superordinate category labels when advertising an innovative product might have a positive effect.

Previous research argues that in an industry, different types of actors interact with each other and may respond differently to the same product (Wijnberg, 2011). Gemser, Leenders, and Wijnberg (2008) for example found that consumers, experts (such as critics), and peers (such as competing producers) have different product evaluations, and that these evaluations have different effects on market success. Future research could investigate whether or not providing category labels has a different effect on these different types of actors. This could also be combined with the different types of categories mentioned previously (i.e. labels created through compounding, derivation, or completely anew). It could be that experts might be mostly attracted to completely new category labels, while consumers appreciate labels that reveal more familiarity. This is relevant because experts often act as influencers. Thus, experts could help to successfully introduce completely new category labels on the market.

4.7.2 Managerial implications

This paper highlights the importance of category labels, and particularly the importance of the effect of categories that differ in their degree of maturity. As category labels can have an effect on both newness perception and product evaluation of innovative products, sellers should choose the category labels that they want to provide carefully. For example, sellers should be aware of the degree of maturity of the category label. Moreover, they should be aware of how the consumer side of the market understands the category label that the seller is planning to provide.

Sellers of innovative products particularly need to consider that multiple labels are in use when a category is emerging (Grodal et al. 2014). This study demonstrates that labels have a different effect on product evaluation. Choosing a 'wrong' label might have a negative effect on the market performance of the product. Thus, prior to using a category label, sellers should test how the category label is perceived by consumers. Moreover, sellers should test how the same category label can have different effects, depending on how innovative the consumer is. This knowledge can be used to choose the 'right' label, which fits both the degree of innovativeness of the product, as well as of the consumer.

4.7.3 Conclusion

This study shows that category labels in particular have an effect in the case of innovative products. Those products are often harder to quickly understand because it is more difficult to categorize them. Both consumers' perceived newness and product evaluation are positively affected by an emerging category versus a mature category label. In addition, this effect is reinforced by consumer innovativeness. This study highlights the importance of sellers choosing the 'right' category when advertising an innovative product. This study is a first step towards investigating when and how category labels from emerging product categories should be used to reduce the risk of failure of innovative products on the market.

Chapter 5

MIND THE GAP: DIFFERENCES IN CLASSIFICATION BY THE PRODUCTION AND CONSUMPTION SIDE OF THE MARKET AND MUSIC FESTIVAL SUCCESS

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Abstract

Producers and consumers – who represent opposing sides of the market – have different frames of reference, which may result in differences in the classification of the same products. This study aims to demonstrate that ‘classification gaps’ have a negative effect on the performance of products, and that these effects play a role in different stages of consumers’ decision process. The data collection consisted of three comprehensive parts, covering production and consumption in the music festival market in the Netherlands. The first part focused on festival organizers who were asked to classify their own music festival in terms of musical genres. In total 70 festival organizers agreed to participate. The second part measured the genre classification of 540 consumers. In the third part, 1554 potential visitors of music festivals in the Netherlands were interviewed about their awareness of the festival and whether or not they considered visiting or visited the festival. This paper provides empirical evidence that a classification gap between the production side and the consumption side of the market has negative effects on music festival performance. This is due in part, to reduced activation of potential consumers in the marketplace. This paper demonstrates that a fundamental – but understudied – disconnect between the two opposing sides of the market (i.e., producers and consumers) regarding the classification of the same products can have negative effects on the performance of these products.

5.1 Introduction

It has been acknowledged that producers and consumers bring different perspectives to the market and that they may perceive the market and the products in it differently (Giesler, 2008; Rosa et al., 1999; Steinman et al., 2000). This paper examines situations in which consumers and producers have different perceptions about the categorical identity of the same product. Categories are sense-making devices (Murphy, 2002; Ross, 1996), on the basis of which consumers create expectations for the products that are in these categories (Eguaras et al., 2012; Suchman, 1995). If consumers cannot easily identify a product's category membership, product evaluations can be negatively affected (e.g., Gregan-Paxton et al., 2005; Gregan-Paxton, et al., 2002; Lajos et al., 2009; Moreau et al., 2001; Noseworthy and Trudel, 2011; Zhou and Nakamoto, 2007). To provide consumers with guidance about how to categorize a product, producers can use category cues. These category cues can provide explicit guidance to consumers in their categorization efforts, and thereby help consumers decide to which alternatives the product should be compared to (Mogilner et al., 2008).

Even in the presence of category cues, consumers and producers can have different perceptions regarding which category a product belongs to. This difference is called the *classification gap*. For instance, a producer of running shoes can perceive this product as belonging to the category of high-performance professional sporting goods, while a consumer may perceive running shoes as an exclusive fashion good. The notion of a classification gap represents a more fundamental disconnect between the two opposing sides of the market (i.e., producers and consumers) than is normally acknowledged in the positioning literature (e.g., Punj and Moon, 2002; Ries and Trout, 1986). The positioning literature suggests that producers offer products that provide optimal value relative to competing products, to the consumer. Precisely which products are considered to be competing will depend on how the consumer categorizes the focal product, which – in the case of a classification gap – differs from the categorization of the producer.

The empirical setting was the Dutch music festival industry. While the music industry has been suffering from consistently decreasing sales over the last decade (e.g., Liebowitz, 2008; Sinha et al., 2010), the music festival market has been performing well (e.g., Festival Insights 2013; Grose, 2011; VVEM 2013). As observed by Gamble and Gilmore (2103) – contrary to the recorded music sector – the live music sector seems – as

of yet – largely unaffected by digital piracy. However, the growth of the music festival market has also resulted in increased competition, and many festival organizations currently face questions about the viability of their festival as they compete for visitors (Festival Insights 2013; VVEM, 2013).

Music festivals consist of multiple musical performances within finite time frames and spaces – even though they may be held at regular intervals (Saleh and Ryan, 1993). The dominant way to categorize music products is in terms of genres, which can be defined as: “systems of orientations, expectations, and conventions that bind together an industry, performers, critics, and fans in making what they identify as a distinctive sort of music” (Lena and Peterson 2008, p. 698). Most consumers are led in their choices of music festivals by the musical experience that they expect, and therefore the music genres that they expect the festival to offer (Bowen and Daniels, 2005; Pegg and Patterson, 2010). Anecdotal evidence suggests that neither consumers nor artists appreciate when festival producers program an artist from a genre that is not associated with the festival. For example, the producers of the 2015 edition of the Glastonbury rock festival in Glastonbury decided to program the rap artist Kanye West, which received a lot of resistance from both rock star Ronnie Wood – the guitarist of the Rolling Stones – and many consumers (Mirror, 2015).

Music festivals are ‘special events’ and ‘unique market offerings’ with characteristics that are often different from other market offerings (Hede and Kellett, 2011). Similar to other special events, music festivals are on-off occurrences that are limited in duration, and are dynamic in that they continuously change their contents (e.g. the performing artists and their music) (cf. Hede and Kellett, 2011). Due to this dynamic nature of music festivals, their classification can change from year to year, making it an excellent setting for this study.

The contributions of this study are threefold. First, this study presents arguments that a classification gap can have detrimental implications for market performance. Second, this study demonstrates how the classification gap affects product success. More specifically, it argues that the classification gap leads to ineffective consumer activation, which prevents the product from entering the purchase decision stage. Third, this study provides an empirical test of the effects of the classification gap in the culturally, socially and economically important, but understudied industry of music festivals.

The outline of this paper is as follows. First, relevant literature on the effects of categorization and product evaluation is reviewed, on the basis of which hypotheses regarding product success were formulated. The empirical setting, and the data collection process and measures are described in the methods section. Subsequently, the results are discussed and a conclusion rounds off the paper.

5.2 Theory

5.2.1 Classification

Categories can be seen as socially constructed cognitive orderings (Rosa et al., 1999). Since categories are sense-making devices (Murphy, 2002; Ross, 1996), the categories perceived by consumers create expectations for the products and producers that are in these categories (Chocarro Eguaras et al., 2012; Suchman, 1995). Consumers often use prior knowledge to categorize new products (Gregan-Paxton et al., 2005; Moreau et al., 2001; Noseworthy and Goode, 2011; Yamauchi and Markman, 2000). Although many products combine elements from multiple categories, consumers tend to use knowledge from only one category to gain understanding of and evaluate something new (Gregan-Paxton et al., 2005; Moreau et al., 2001; Murphy and Ross, 2010; Noseworthy and Goode, 2011; Rajagopal and Burnkrant, 2009). Indeed, Murphy and Ross (2010) suggest that consumers tend to use only the first category that they perceive to make sense of the product, if this category provides a viable answer. This “single category belief problem” (Rajagopal and Burnkrant, 2009) provides producers with challenging decisions in terms of product development and the signals that they send out to promote and position their products. Generally, consumers are not tolerant of organizations that are not easy to classify (e.g., Gregan-Paxton et al., 2005; Gregan-Paxton et al., 2002; Lajoset et al., 2009; Moreau et al., 2001; Noseworthy and Trudel, 2011; Zhou and Nakamoto, 2007;).

Both the marketing literature and the sociology/organization literature on classification (e.g., DiMaggio, 1987; Hsu, 2006; Hsu et al., 2009; Pontikes, 2012; Zuckerman, 1999; Zuckerman and Kim, 2003) tend to focus on actors that represent the consumption side of the market. However, as categories are socially constructed, actors on both the consumption and the production side of the market can have different

classifications of the same product. This can occur due to their different frames of reference, for example, a production and competitive frame versus a frame based on consumption and value (Rosa et al., 1999). This study investigates the presence and the effects of this difference in the music festival market, where many festival organizations that compete for visitors and music programs change every year, which may create classification challenges between the two opposing sides of the market: producers and consumers.

5.2.2 The classification gap

In a competitive arena different actors interact with each other (e.g., producers, consumers, critics), and these actors often have different economic interests and different economic relations to the product that is offered in that arena (Wijnberg, 2011). Prior research has, for example, analyzed how product evaluations by consumers, experts, and competing actors (peers) may differ, and the differential effects that these evaluations have on market success (e.g., Gemser et al., 2008).

This paper argues that actors on different sides of the market, especially producers and consumers, operate in different contexts, have different knowledge structures, and may use different comparative frames regarding substitutability of products (Rosa et al., 1999). Consumers' demands are rooted in their usage requirements and relate to the benefits that the product provides and the available alternatives that can provide similar benefits (Day et al., 1979). The demands of producers relate to their product and its competitive space, and the resources needed to develop this position (Porac et al., 1995). It argues that the differences in demands among consumers and producers can cause them to perceive the market differently, resulting in a disconnect that has broad performance implications.

Both consumers and producers use categories to make sense of a competitive arena (Porac et al., 1995; Sujan 1985). However, as producers and consumers have different perceptions and comparisons, the way that they categorize a product might also be different, even if the categorization system is widely accepted and shared. Noseworthy et al. (2012) have shown that competitive context is important for how people categorize products within that context. As producers and consumers have different roles in a particular context and can experience the context differently, they may also have different perceptions about

product classification. In this paper, the term classification gap is used to signify the difference in classification of the same product by the production side and the consumption side of the market.

Theoretically, the differences in classification between the two sides of the market can even go further; the consumption side can, for example, identify categories other than those that the production side identified, but they can also identify more categories than the production side and vice versa. Because the manner in which actors classify products and services builds on their understanding of the domain and shapes their understanding of the objects in the domain, it is expected that differences in classification between actors who are involved with different sides of the same market (i.e. production and consumption side) will have strong repercussions for how this market will function. In fact, this is a complex marketing problem because it implies that the incommensurability of meaning systems can put a fundamental penalty on the market performance of the organizations in an industry. If there is a mismatch, consumers may not be convinced to make the purchase, or they may not be activated in the first place (Spence, 1973).

5.2.3 The classification gap and product performance

Consumers come to purchase decisions by gathering and interpreting information about brands or products that they are considering purchasing (e.g., Alba and Hutchinson, 1987; Belonax and Mittelstaedt, 1978; Shugan, 1980). According to standard positioning theory, one of the key tasks of producers is to send the right signals to position the product in the mind of consumers as addressing their needs more effectively than other offerings. The closer the moment of an eventual consumer choice is, and the more it is a prominent part of consumers' needs the more consumers will be willing to invest in information gathering and to enter some form of evaluation process (Bettman et al., 1998; Hauser and Wernerfelt, 1990; Roberts and Lattin, 1991). During this stage consumers use the available signals and information in combination with their previous experiences and knowledge to determine whether the product is worth purchasing.

During the process of evaluating products, consumers may gather information that does not match their expectations, which is more likely to occur in the case of a classification gap. For a number of reasons, a

classification gap can have serious consequences on product performance. First, the new and unexpected knowledge about the product might arouse feelings of mistrust because consumers may feel that the producer provided them with incorrect information (Geyskens et al., 1998; Sirdeshmukh et al., 2002). Consumers' understanding of what the product is, and their confidence that the producer understands the product in the same way, may create a gap that will lower the appeal of the product and will have a negative effect on its perceived value if the classification is not shared (Garbarino and Edell, 1997). Second, the cognitive effort needed to understand unexpected information is higher than that needed for expected information (Heckler and Childers, 1992). As consumers prefer to simplify their purchase decisions (Bettman et al., 1998), this unexpected information makes their decision more difficult, which in turn may result in a decision not to purchase the product. Third, in the case of a classification gap, newly gathered product information refers to one or more categories that differ from the categories that the consumer has in mind. This makes it harder to identify the category membership of the product. As indicated earlier, prior research in marketing (e.g., Gregan-Paxton et al., 2005; Lajos et al., 2009; Moreau et al., 2001) and organization sociology (e.g., Hsu, 2006; Hsu et al., 2009; Pontikes, 2012; Zuckerman and Kim, 2003) has shown that consumers' evaluations can be negatively affected if they cannot easily identify the category membership of a product. In sum, it was expected that a classification gap would have a negative effect on the market performance of the product.

Hypothesis 1: A classification gap between the production side and consumption side of the market has a negative effect on product performance.

5.2.4 The classification gap and market activation

Consumers go through different stages before a purchase decision is made (Punj and Brookes, 2002). Marketing scholars have examined the different stages of a consumer purchase decision in depth (e.g., Bettman, 1979; Johnson and Payne, 1985; Kardes et al., 1993; Shocker et al., 1991). Implicit in this conceptualization is the notion of a threshold that must be exceeded before consumers choose an alternative to the next decision stage towards adoption.

Consumer decision models have a nested nature and the number of consumers who decide to purchase the product is in general, smaller than the number of consumers who are aware of the product (Gronhaug, 1973; Shocker et al., 1991). If a producer can grab the attention of the market for a product, consumers will be activated to start a decision-making process by considering this product (Punj and Brookes, 2002). Not all product alternatives, however, will receive sufficient market attention and not all producers can sufficiently activate consumers to start considering a product (Gronhaug, 1973). This paper suggests that a possible classification gap affects the final stage of the consumer decision-making process when consumers make their purchase decision, and it impacts on the likelihood of activating the market to consider the product in the first place.

The market can be activated through marketing activities that are deployed by the producer, especially through advertising (Zhao, 2000). The starting point is that producers must encourage consumers to weigh the cost of evaluating a product against the expected benefits of considering – and eventually buying – the product (Roberts and Nedungadi, 1995). The expected benefits of considering one more product seem greater if the product is a member of a category that the consumer is interested in. Therefore, there is a cost–benefit approach to considering the product, whereby the consumer invests in the search and evaluation process to assess the extent to which alternatives fit the category of their interest (Hauser and Wernerfelt, 1990; Roberts and Lattin, 1991). Consumers will only consider products if they belong to a perceived category that is of sufficient interest to them (Nedungadi, 1990). This occurs when consumers interpret the signals that a producer has sent in a manner that they identifies the product as part of a category that they are actively or passively interested in.

In the context of this cost–benefit approach, positively and negatively reinforced feedback loops can ensue, which will be affected by the classification gap. If consumers identify a product or producer as likely to belong to a category of interest, they will generally be willing to invest more in search activities and explore further product and communication signals (Alba and Lynch, 1997). In this case, if the signals originating from the producer reinforce the consumer’s original opinion, then the consumer will be activated to start considering the product. However, if there is a classification gap, and the consumer does not think that the product is in the favored category that the producer thinks it is in, the consumer will stop considering the product before

seriously investigating the producer's signals. In addition, if consumers think the product is in their category of interest, but they receive producer signals that create doubts about the categorical identity of the product, they will be likely to stop searching for further information or to create a delay in the adoption decision.

Thus, it was expected that the negative effect of a classification gap on product performance would be in part, generated by lower market activation during the earlier stages of the consumer decision-making process.

Hypothesis 2: Market activation mediates the effect on product performance of a classification gap between the production side and consumption side of the market.

5.3 Methodology

5.3.1 Empirical setting: Music festivals

The empirical setting for this study was the music festival industry in the Netherlands. The Netherlands has one of the richest music festival histories in Europe and is home to several of the oldest and most well-known music festivals in the world, such as *Pinkpop*, *North Sea Jazz Festival*, and *Sensation* (Leenders et al., 2005). According to the Vereniging van Evenementenmakers (VVEM, 2013) – a Dutch association for the event industry – music festivals in the Netherlands attracted 12.8 Million visitors across 520 different music festivals in 2013. The total revenue from ticket sales was €119.7 million (in 2012).

5.3.2 Sampling and data collection

The data collection consisted of three comprehensive parts that covered production and consumption in the music festival market in the Netherlands. The first part of the data collection focuses on festival organizers. A list of 120 music festivals was created from public sources such as national and regional newspapers. The 120 music festivals were analyzed using desk research of publicly available information on the organization, age, the entrance fee, and the audience size. To measure the classification from the producer perspective, we used an informant

approach and asked the 120 directors of the music festivals – using a survey – to classify the genre of their festival. The response to the survey was $n = 73$ (61%). Considering that we asked the most knowledgeable informant, and given that festivals were organized by relatively small organizations, no substantial response errors were expected and a single informant approach was considered justified (Anderson, 1987). The genre classification is discussed in detail later.

The second part of the data collection enabled the measurement of the genre classification from a consumption perspective. Given that consumers vary in terms of knowledge about the festival, an attempt was made to control for knowledge by only including knowledgeable informants in this task. To identify informants who were knowledgeable about the consumption side of the market, 540 people were interviewed who indicated that they had visited at least one music festival in the Netherlands in the last 12 months. The interviews focused on their last-visited festival and asked for a genre classification for the most recently visited festival only (this way their memory about the experience was fresh). This approach meant that the genre classification was based on a recent experience and that respondents did not have to provide a genre classification for multiple festivals or a festival that they were less familiar or unfamiliar with. In other words, the respondents from the consumer side of the market were knowledgeable and involved, similar to the sampled producers. Moreover, measuring the classification of potential festival attendees – instead of the ones who visited the festival – would have meant that they had to score a whole range of festivals (i.e. 120 in this case), including the ones that they did not know. This could have led to fatigue issues and incomplete questionnaires, and it would create an unreliable classification measure that was prone to knowledge biases.

Using the classification from the production side and the consumption side of the market, the festival classification of the two sides was matched, resulting in a classification gap measure. The number of consumer informants per music festival in the database ranged from 1 to 140. Several analyses were performed using a minimum of one highly informed consumer per music festival up to a maximum of ten informed consumers. The results proved consistent, irrespective of the cut-off level. In the analyses, using a minimum of two informed consumers per music festival (e.g., Ashton and Ashton, 1985; Libby and Blashfield, 1978) resulted in a final data set of $n = 70$ music festivals.

The third part of the data collection focused on the festival market performance and its success in activating the market to consider visiting the festival. Unfortunately, public and commercial data on festival visitor numbers is limited and only visitor numbers for 37 festivals were obtained (see robustness checks). Data on activation is also not publicly available and had to be collected. To this end, a representative panel of potential visitors was created to observe their recent decision making and behavior regarding music festivals. This phase consisted of interviews using a representative sample of 1554 potential visitors of music festivals in the Netherlands. Potential visitors were defined as people between the ages of 16 and 65. The interview locations, often shopping centers, were not linked to any festival or music event.

The resulting audience pool was stratified to be representative of the Netherlands as a whole in terms of geographic distribution across regional provinces and age. Respondents were interviewed about their music festival knowledge, decision making, and visit behavior related to each of the 70 festivals in the sample. For each of the 70 festivals, respondents had to indicate whether or not they were aware of the festival, and whether they had considered visiting, or had visited the festival (cf. Gronhaug, 1973). The audience pool that was constructed was an innovative approach to representing the total potential market, in which some consumers have bought the product, others may have considered but not have bought the product, and other consumers may not have considered buying the product.

5.3.3 Festival market performance

Apart from the visitor numbers for 37 festivals from public sources, two measures of festival performance were developed from the consumer panel (n=1554) for each of the 70 festivals in the sample. These two performance variables relate to two stages in the consumer decision making process: the market activation stage where consumers decide to consider the festival, and the decision stage, or whether consumers visited the festival or not. Both measures have count data properties as they represent the total number of people that considered or visited the festival out of the panel.

To exemplify the data, Table 5.1 shows market activation, market performance, and the observed classification gap (measured using Jaccard coefficients, see below) for ten of the larger music festivals in

the Netherlands which were also part of the sample. As shown in Table 5.1, there is variation in market activation, market performance, and classification gaps across festivals.

Table 5.1 Ten of the larger festivals in the Netherlands*

<i>Festival</i>	<i>Market activation</i>	<i>Market performance</i>	<i>Classification gap</i>
Dance Valley	165	75	0.04
Mysteryland	129	62	0.21
Grachtenfestival	70	41	0.42
Lowlands	320	140	0.54
Pinkpop	305	136	0.58
Koninginnenacht	137	103	0.64
Parkpop	167	107	0.67
Bevrijdingspop	151	119	0.67
North Sea Jazz	230	105	0.69
Night of the Proms	98	64	0.78

*Sorted by size of classification gap

5.3.4 The classification gap

The key independent variable in this study is the classification gap that results from the fact that the knowledge structure and frames of producers can be disconnected from the knowledge structure and frames of consumers (Rosa et al., 1999). A genre classification was obtained for a collection of nine common music genres. The set of genres were: 1) Pop, 2) Rock, 3) Dance, 4) Jazz, 5) Hip Hop, 6) R&B, 7) Classical, 8) World, and 9) Folk. These genres were selected from news items in the popular press regarding the initially sampled 120 festivals, and were further validated by three festival organizers and three festival consumers who had a broad knowledge of the festival market. No additional classification labels were needed in their view. At the time of data collection, these labels were also used by music websites such as www.allmusic.com, www.muzyiek.nl, www.bbc.co.uk/music.

To measure the classification gap, Jaccard's coefficients that measure the similarity or dissimilarity between the classifications from

the production side and the consumption side of the market was used. The Jaccard distance measure takes the following form:

$$J_D = \frac{q + r}{p + q + r}$$

where J_D is the Jaccard distance coefficient that lies between $J_D = 0$ (completely similar) and $J_D = 1$ (completely dissimilar), q is the number of genres mentioned by the producer that were not mentioned by the consumer, and r is the number of genres mentioned by the consumer that were not mentioned by the producer. The total number of genres mentioned by both the individual consumer informant and the producer informant is indicated with p . For example, if the consumer informant classifies a music festival as belonging to pop and rock, and the producer classifies its music festival only as rock, then the Jaccard coefficient is $1/2$.

First, the Jaccard difference between the producer and each consumer that genre classified the festival was measured. Subsequently, the average of all of the different gap sizes was taken to determine the classification gap score at the level of the music festival. The fact that the classification gap was measured at the market level ensured that this measure does not suffer from individual knowledge bias and increased the unreliability of the consumer side of the gap measure. Since both sides of the gap were measured through the most knowledgeable informants, the validity (and therefore reliability) of the measure's components is high.

5.3.5 Control variables

Classification span

Some products – and in this case music festivals – combine elements from multiple categories, and are for that reason more difficult to categorize. Products that span multiple categories risk being ignored or undervalued because consumers might not perceive those products as a legitimate member of one category (Gregan-Paxton et al., 2005; Lajos et al., 2009; Moreau et al., 2001). Therefore, the genre classification span of the music festival was controlled for. This measure was operationalized

using the average number of genres – mentioned by the informants – per festival.

Free festival

Whether or not consumers have to pay to visit a festival may prevent them from considering and visiting a festival. Given that there is price variation depending on days, arrangements, and timing, a dummy variable was used in which a basic distinction between free and paid festivals was made. This information was obtained from the festival websites.

National festival

National festivals have, in general, larger marketing budgets. Larger marketing budgets allow festival producers to generate more attention and appeal for their festival, which can have a positive effect on consumers' tendencies to consider and visit a music festival. Unfortunately, marketing budgets are not readily available for the Dutch music festival industry. A dummy variable was developed by scanning national newspapers and media regarding whether or not the festival was advertised or reviewed beyond the regional borders.

Festival age

Festival age was controlled for, and was measured by the number of years that the festival had been on the market. Festivals that have existed for longer periods of time will have established a larger 'fan base' and a certain reputation and recognition, which can have a positive effect on the number of consumers that consider and visit a music festival. Information about festival age was obtained from the festival website.

Music genres

Two of the most popular music genres were controlled for – (electronic) dance and pop – as music festivals with these music genres generally attract a large number of visitors.

International stars

Some festivals program international stars that can attract a large number of visitors. International stars were controlled for and this variable was measured by identifying whether the performing bands or musical artists appeared in the Billboard top 100 charts during the year of the festival.

5.4 Results

Table 5.2 presents the descriptive statistics of the variables used in this study. On average, the classification gap of the festivals in the sample was $M = 0.56$, $SD = 0.38$. As expected, the average market activation was higher than the average market performance ($M = 58.16$, $SD = 68.37$ versus $M = 30.76$, $SD = 35.50$). In other words, the number of people activated to consider the product was higher than the number of people who visited the festival.

Table 5.2 Descriptive Statistics (n = 70)

<i>Variables</i>	<i>Mean</i>	<i>s.d.</i>	<i>Min</i>	<i>Max</i>
1. Classification gap	0.56	0.38	0	1
2. Market activation	58.16	68.37	2	320
3. Market performance	30.76	35.50	2	140
4. National festival	0.57	0.50	0	1
5. Free festival	0.60	0.49	0	1
6. Festival age	15.56	8.73	3	38
7. Classification span	1.74	0.79	1	5
8. Dance genre	0.47	0.50	0	1
9. Pop genre	0.35	0.48	0	1
10. International stars	0.41	0.50	0	1

There were more national than regional festivals and more free than paid festivals in the sample (respectively, $M = 0.57$, $SD = 0.50$ and $M = 0.60$, $SD = 0.49$). On average, the festivals were relatively old ($M = 15.56$, $SD = 8.73$), which is not surprising given the fact that the Netherlands, and Europe in general, has a rich festival tradition. In the last couple of years (electronic) dance has become more popular. Indeed, approximately half of the Dutch music festivals producers had 'dance' in their program ($M = 0.47$, $SD = 0.50$). Finally, 41% of the festivals had one or more international stars in their line-up.

Table 5.3 presents a negative binomial regression results. Negative binomial regression models were estimated because the dependent variable consisted of count data (Gardner et al., 1995). Multicollinearity is not a major concern, as all VIF scores were between 1.23 and 1.86. As the sample size was modest, bootstrapping was used by generating 1,000 samples (Speed, 1994). As presented in Model 1 in Table 5.3 (i.e. the simple model), the classification gap had a significant negative effect on market performance ($\beta = -0.71$, $p < 0.05$). The control variables 'free festival', 'festival age', and 'classification span' were not significant. The scope of the festival had a positive significant relationship with festival market performance ($\beta = 0.55$, $p < 0.05$). Furthermore, the controls 'dance', 'pop', and 'international stars' demonstrated a positive significant relationship with market performance (respectively, $\beta = 0.75$, $p < 0.01$; $\beta = 0.69$, $p < 0.01$; $\beta = 0.57$, $p < 0.01$).

As presented the full model - Model 2 - in Table 5.3, market activation was included as an independent variable in relation to market performance. The market activation variable obtained a significant and positive coefficient ($\beta = 0.01$, $p < 0.01$) and the classification gap had a significant and negative relationship with market performance ($\beta = -0.52$, $p < 0.01$). Therefore, these findings support Hypothesis 1.

To examine whether the effect of the classification gap was mediated by a lower activation of potential visitors, a multi-step mediation assessment using negative binomial regression models was followed (Baron and Kenny, 1986; Preacher and Hayes, 2008). The first step is provided by the test of Hypothesis 1. The second step was to identify a decrease in the effect of the classification gap on market performance when the market activation variable is included. Table 5.3 shows that this was the case ($\beta = -0.71$ versus $\beta = -0.52$) and this pattern was similar with respect to standardized and unstandardized coefficients. The next step was to determine whether or not there was a

significant relationship between the classification gap and market activation. Model 3 of Table 5.3 shows that this was the case ($\beta = -0.50, p < 0.10$). The final step was to test whether market activation had a significant effect on market performance. Model 2 of Table 5.3 also demonstrated a positive significant effect ($\beta = 0.01, p < 0.01$).

Table 5.3 Negative binomial regression

Variables	Market performance						Market activation		
	M.1			M.2			M.3		
	β		S.E.	β	S.E.	β	S.E.		
Classification gap	-0.71	*	0.31	-0.52	**	0.21	-0.50	†	0.28
Market activation				0.01	**	0.00			
National festival	0.55	*	0.24	0.26	*	0.18	0.42	*	0.22
Free festival	-0.21		0.26	-0.20		0.21	-0.08		0.24
Festival age	0.01		0.01	0.01		0.01	0.00		0.01
Classification span	-0.19		0.16	-0.06		0.14	-0.18		0.15
Dance genre	0.75	**	0.23	0.24		0.17	0.72	**	0.21
Pop genre	0.69	**	0.28	0.10		0.22	0.66	*	0.28
International stars	0.57	**	0.23	0.12		0.17	0.88	**	0.23
Log likelihood	-288.87		-280.10		-332.96				
df	61		60		61				
-2 x Δ Log likelihood			17.54		**				

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Meeting these steps does not, however, conclusively establish that mediation has occurred. The conclusions from this mediation analysis are only valid if the causal assumptions are valid (Judd and Kenny, 2010). For example, the mediation may be caused by the outcome variable rather than the outcome variable causing the mediator. However, in this case the activation stage where the opportunity was assessed and alternatives were considered was generally conceptualized as an earlier stage in the decision making process and the reverse is hard to imagine (Punj and Brookes, 2002).

Another issue that may affect the validity of the mediation assessment is measurement error; however, as discussed previously, the measure of the classification from the consumption side seemed

unaffected by the addition of more informants, and the results were similar (albeit at somewhat lower significance levels) if the number of informants for the consumer side classification was increased (at the expense of sample size). Furthermore, the market activation and performance measures were based on unambiguous and simple questions about whether or not a consumer had considered going to the festival or had visited the festival. Respondents could easily answer these questions and no long questionnaires that can cause fatigue were used. The measure of classification by the production side of the market was also likely to be highly reliable, as the most knowledgeable person was interviewed. Finally, there may be biases because of omitted variables; in response to this possibility extensive controls were used for important festival characteristics that could affect performance. More importantly, a major source of correlation between the mediator and the outcome variable is often caused by a common method effect. This study used a multimethod approach and obtained data from different sources across the independent and dependent variables which significantly improved the ability to assess mediation.

Finally, the mediation effect was validated using a Sobel test. Bootstrapping with resampling and replacement (1000 times) was used when testing for the direct and indirect effects of the classification gap on market performance of festivals in one analysis. To normalize the dependent variables the natural logarithm of the market performance were obtained along with market activation variables (there were no values of zero) in order to accommodate the PROCESS and Sobel test procedures (version 2.04; obtained from www.afhayes.com). The total effect of the classification gap on logged performance was negative and significant ($\beta = -0.30$, $t = -2.01$, $p < 0.05$), the direct effect of the classification gap was negative and significant ($\beta = -0.17$, $t = -1.7$, $p < 0.1$), and the indirect effect was also negative and significant ($\beta = -0.13$, $z = -1.5$, $p < 0.1$). Similar effects were found when additional controls were added. This provided additional support for the mediation hypothesis and confidence in the comprehensive tests.

Robustness checks

Three additional analyses were conducted to test the robustness of these results. First, in addition to conducting a negative binomial analysis including bootstrapping, the same analysis without bootstrapping was performed. The relationship between the classification gap and market

performance – which was significant when bootstrapping was used – was not significant ($\beta = -0.52, p = 0.16$). In the model without market activation, the relationship between the classification gap and market performance remained significant – albeit at a lower significance level ($\beta = -0.71, p < 0.10$). The effect of the classification gap on activation was not significant ($\beta = -0.50, p = 0.20$).

Second, the remaining seven – out of the nine – musical genres were controlled for. The results show that – when the seven additional genres were added as controls – the effect of the classification gap on market performance and market activation was still significant (respectively $\beta = -0.47, p < 0.05$ and $\beta = -0.64, p < 0.05$). Whether or not a genre label in the name was related to the classification gap was also tested. Again the results demonstrate that this was not the case ($\beta = 0.01, p = 0.95$).

Third, data on the average travel time of the visitors at the festival was obtained and measured as background characteristics of the informants who provided the consumer classification of the last festival that they visited. This paper argues that longer the travel time influences consumers to be more careful when deciding whether or not to go to a festival. In other words, consumers will gather more information about those festivals to minimize the risk of making a wrong purchase decision. Due to this additional information, possible classification gaps – even small ones – might be perceived by the consumer and result in the rejection of the festival in their decision process. Therefore, it was expected that a classification gap would have a negative effect on travel time. OLS regression models were conducted – using the natural logarithm of the average travel time – to test the effect of the classification gap on travel time, which is negative and significant ($\beta = -0.58, p < 0.05$).

5.5 Discussion

5.5.1 Summary and future research

This study examines the effects of a difference in classification of the same product between the production side and the consumption side of the market. The two different sides of the market operate in different contexts with different frames of reference, which can result in different classification perceptions of the same product. Using music festivals as

the empirical setting, this study shows that classification discrepancies between the consumption and production side of the market can create a classification gap that has detrimental implications for market performance. It also shows that lower festival performance is generated, in part, through lower activation of potential visitors in the marketplace. Market activation partially mediates the effect of a classification gap on market performance. Partial mediation may be explained by the fact that during the purchase decision consumers become more careful and gather additional information. When consumers gather additional information they can consciously or unconsciously experience a possible classification gap first hand, with negative consequences for the market performance of the product.

The negative effect of a classification gap on market performance – even when market activation is accounted for – may be influenced by the nature of the object of research, in this case music festivals. A classification gap will generally decrease over time when consumers and producers have repeated interactions with regard to the same product. This, however, also suggests that a classification gap is more likely to occur in contexts where a specific product is only offered once or where products differ largely from previous editions, as is the case in the empirical setting of the music festival industry.

Visiting a music festival provides experiential value rather than instrumental value to consumers (Pine and Gilmore, 1998). In contrast to a tangible product – which can be returned to the store if it is not working as expected – it is not possible to return a bad festival experience to the store, which can make buyers even more careful in the final decision stage. Indeed, as demonstrated by Noseworthy and Trudel (2011), consumers respond less favorable towards ambiguity – which they might perceive in the case of a classification gap – when there is a focus on experiential rather than instrumental product value. It is therefore possible that products in the entertainment industry are particularly prone to the negative effects of a classification gap, especially if consumers only have a limited amount of time to begin considering and make up their mind about visit the festival. However, considering the importance of categorization for non-entertainment industries, it was assessed that other industries will be impacted by a similar classification gap, albeit less visibly. Future research should explore this in more detail. It would also be interesting to study the impact of consumer characteristics. As shown in prior literature, consumer expertise, involvement, and familiarity with a product or

product category can influence information seeking behavior (e.g., Chocarro Eguaras et al., 2012; Gronhaug, 1973; Kuusela et al., 1998), which can influence the occurrence of a possible classification gap.

Future research is also needed to examine the effects of a classification gap in the post-purchase phase. Studies on consumer decision models often do not consider the post-purchase stage. However, this stage is important because consumers may decide to tell others about their experience with the product. As demonstrated in this study, a classification gap will negatively influence the number of consumers who buy the product. However, there may still be consumers who buy the product, and who subsequently find that the product does not fit their classification expectations. This experience can have a negative effect on their post-purchase product evaluations. These evaluations, such as online consumer reviews, can subsequently have a negative effect on product performance (e.g., Chevalier and Mayzlin, 2006; Zhang et al., 2013). This is particularly true in the music industry and other creative sectors, in which there is a naturally high level of ‘consumer co-creation’ in the marketing of products (Gamble and Gilmore, 2013), and consumers tend to actively seek third-party information due to the experiential nature of the products (Situmeang et al., 2014).

This study used genres that are fairly broad, which increased the chance that different actors will classify an object in the same category. However, as emphasized by Glynn and Navis (2013), the unit of analysis matters in studies on classification, and when category definitions are too broad the effects of category spanning may go unobserved. The fact that a measurable classification gap was found at the market level and negative performance consequences were demonstrated while using broad genre labels is therefore a key strength of this study. Future research may study whether the effects of classification gaps change substantially when using categories at lower levels of the classification system: for instance, not only rock, but subgenres ranging from rockabilly to slow-core.

5.5.2 Managerial implications

Every region, city, or neighborhood in Europe hosts at least one or more music festivals per year. There are hundreds of music festivals in the Netherlands and much attention is often paid to the role that festivals play in creating a tourist destination or providing economic benefits to

local communities (Getz, 1991). Music festivals are however, also interesting from a marketing perspective. As competition may be intense – particularly during the prime summer season – many festival organizations must understand how they can effectively compete in such a crowded market. The marketing challenge lies in the fact that each edition of a music festival is – at least partly – different in the key attribute of the experience: the artists. This can increase the mismatch between the musical genres that are perceived between the festival organizers and the consumers. As demonstrated in this study, such a classification gap can have significant negative performance outcomes.

An important managerial implication of this study is that – in general – producers should be aware that classification gaps can occur and that this can have serious consequences. This awareness is not obvious because the category membership of products is often considered obvious. In addition, it cannot be assumed that the classification perceived by one economic group is the same as that of another group. This underpins Rosa et al.'s (1999) claim that categories are *social* cognitive orderings. The awareness of the concept of a classification gap is important for how producers can prevent the negative outcomes of a gap.

To identify a potential classification gap, producers must carefully examine what the classification system looks like on the consumption side of the market, and investigate how consumers will categorize their products. Particularly in industries where categories are dynamic and evolving – which is often the case in entertainment industries – producers need to continuously examine the market environment. Ruef and Patterson (2009), for example, found that spanning categories in emerging classification systems is tolerated because of a lack of clear and socially legitimate boundaries. Indeed, a classification gap that increases over time may be an indication that a category is in 'flux', while a decreasing gap may suggest that a category is stabilizing. Relatedly, when organizations innovate they must pay attention to how they communicate the innovation to eliminate the risk of a classification gap.

5.5.3 Conclusion

This study introduced the concept of a classification gap and provided empirical evidence for the detrimental effects of a classification gap on

both market performance and market activation in the important but under researched entertainment industry of music festivals. This work is intended to stimulate further empirical endeavors by studying the effects of differences in classification between producers and consumers in different settings and different stages of the consumer decision-making process.

Chapter 6

DISCUSSION AND CONCLUSION

The main aim of this thesis is to gain a better understanding of the effects of categorization in cases where products can be categorized into multiple categories or cannot be clearly categorized into an existing category. This thesis combines insight from organization theory and marketing literature, and this insight is categorized into four theoretical themes. In this final chapter the implications for the main theoretical themes that were identified are discussed, including suggestions for future research based on these findings. In addition, implications for practice are discussed.

6.1 Theoretical implications for the themes

6.1.1 Implications for Theme 1: The effects of spanning categories

Theme 1 discussed the phenomenon of category spanning and the consequences of spanning multiple categories. Many studies published in marketing and organization literature suggest negative consequences of category spanning (Hsu, 2006; Leung and Sharkey, 2013; Moreau et al., 2001; Rajagopal and Burnkrant, 2009). However, there are also studies that demonstrate that, under certain conditions, category spanning might not have negative effects and may even have positive effects on performance (Gregan-Paxton et al., 2005; Moreau et al., 2001; Pontikes, 2012; Rajagopal and Burnkrant, 2009; Wry et al., 2014). Overall, this literature suggests that the effects of category spanning depend on the categories that are spanned (Wry et al., 2014), the contrast of the categories (Kovács and Hannan, 2010), and the signals that producers send to reveal the categorical membership of themselves or their products (Gregan-Paxton et al., 2005; Moreau et al. 2001). This thesis contributes to this literature by providing a framework that helps producers to assess whether or not they should engage in category spanning behavior (Chapter 2), and by identifying conditions that can affect how producers engage in category spanning behavior (Chapter 3).

Chapter 2 focuses on a specific type of category spanning behavior; namely, producers that aim to introduce hybrid products that combine product and service elements into PSS'. As producers struggle with developing and marketing effective PSS' (Baveja et al., 2004; Neely, 2008; Stanley and Wojcik, 2005; Ulaga and Reinartz, 2011), and knowledge about PSS' is limited, a framework that can be used by producers to

identify effective PSS' is proposed. The framework builds on the core idea that products and services differ from each other regarding the value that is created by the tangibility or non-tangibility and the interaction or non-interaction between producers and customers. It is argued that the product and service elements of an effective PSS should have sufficient autonomous value to be sold separately on the market. Two empirical studies were used to test these ideas.

The findings of the first study, in which product and service developers were surveyed, shows that the respondents agreed with the proposed difference between products and services (i.e. tangibility and interaction), which was crucial for the proposed framework. The second study examined an offering that combined product and service elements. A Vickrey auction was used to measure whether or not the products and services that made up the PSS delivered synergetic value. This auction provided a relatively quick and valid method – due to the measurement of real buyer behavior – for measuring consumers' willingness to pay for a PSS and its separate elements. The results show that the offering tested in this study, which on first sight looked like a PSS, did not appear to be an effective PSS because customers' willingness to pay did not increase when positioning this offering as a PSS compared to positioning it as a product. This finding also underpins the difficulty of developing effective PSS' that are valued by the market such that it makes economic sense to develop such a PSS. Although the framework was empirically validated, future research is needed to investigate how other actors involved in the new PSS development process use, understand, and agree with this framework.

Second, this research contributes to the literature on the effects of category spanning behavior by demonstrating, in Chapter 3, that producers' strategic design decisions when combining multiple categories into a hybrid product is influenced by their competitive positions (i.e. their market share) and the competitive context (i.e. the emergence of the category) that they operate in. The concept of category markers is introduced to refer to design characteristics that are typical for a certain category, and potentially denote that category. The hypotheses were tested by conducting structured interviews with designers and providing them with a range of possible contextual scenarios for the use of category markers.

It was observed that that the use of category markers by producers that engaged in category spanning behaviour was dependent on a product's original market share; the larger this market share was the more likely

producers were to use the category markers of this product when combining it into a hybrid product. Moreover, when both product categories were emerging rather than mature, producers were less likely to use any category markers from these categories for the hybrid product. When only one category was emerging and the other was mature producers were likely to use the category markers from the mature category.

The findings show that producers' design decisions that influence a product's appearance, are influenced by the competitive context and their competitive position. Future research, could study whether producers' experiences and organizational identities could affect their design decisions. For example, producers who are known for their innovative design might try to maintain that identity by making more radical design decisions. Since hypothetical scenarios were used, future research could also investigate producers' actual design decisions in order to study how their design decisions are influenced.

6.1.2 Implications for Theme 2: Category consensus

Theme 2 relates to the phenomenon of whether market actors agree or disagree on the categorical membership of the same product or producer and the impact of this 'category consensus' or lack thereof on performance. Prior studies have examined the degree of category consensus among one type of market actor and its effects (Hsu, 2006). Other studies have examined the degree to which market actors might have different preferences for products or producers that cannot be categorized easily (e.g. Pontikes, 2012; Goldsmith et al., 1998; Midgley and Dowling, 1978). However, none of the existing studies have examined if and how a lack of category consensus between different types of market actors (e.g. producers and consumers) affects performance.

As reported in Chapter 5, this research attempts to fill this gap in the existing literature by examining whether producers and consumers categorize the same product differently, and how this lack of consensus may influence performance. Producers and consumers tend to have different frames of reference for products (Rosa et al., 1999), which could result in such a lack of consensus, referred to here as a classification gap. Data was collected through surveys. First, festival organizers (n=70) were asked to classify their own music festival in

terms of musical genres. Second, the genre classifications of 540 consumers were measured. Third, 1554 potential visitors of music festivals in the Netherlands were asked about their awareness of the festival and whether or not they considered visiting or visited the festival. The main findings of Chapter 5 are that producers and consumers can indeed categorize the same product differently, and that such a classification gap has a negative effect on the market performance of a product. This study also found evidence suggesting that the negative effect on market performance may partly be explained by a lower 'activation' in the early stages of a customer's decision making process.

This study demonstrates the negative effects of a classification gap. However, it would also be interesting to investigate the antecedents of a classification gap. It would, for example, be interesting to investigate if producers' market shares or media coverage have a negative effect on the occurrence of a classification gap.

6.1.3 Implications for Theme 3: Dynamic character of categories

Theme 3 focuses on the fact that categories are dynamic and evolve over time (Rosa et al., 1999). Prior research suggests that radical innovation often triggers the emergence of a new category (Garcia and Calantone, 2002; Rindova and Petkova, 2007; Veryzer, 1998). New, emerging categories offer challenging decisions to producers who want to operate in emerging categories in terms of, for example, their choice of technological and design features of the product and the use of category labels. This research contributes to the extant literature by examining the type of decisions producers make about design features when a category is emerging versus when it is mature (Chapter 3), and the effects that category labels have depending on their degree of emergence (Chapter 4).

The study reported in Chapter 3 (see Section 6.1.1) suggests that producers make different design decisions when a category is emerging versus when it is mature. More specifically, producers seem to perceive more freedom for innovative in the visual design of new products that combine multiple emerging categories. Future research could empirically investigate whether or not producers who design aesthetically innovative products from emerging categories have a

better chance being the ‘founders’ of a dominant ‘visual’ design (cf. Eisenman, 2013). In addition, future research could investigate the role of media coverage in this process. Products that are visually innovative could attract more media coverage, and become more familiar to consumers, and to competitors who might adopt the innovative design as typical for that category.

Chapter 4 examines the effect of providing category labels that represent categories that differ in their degree of emergence. By providing category labels, producers can guide consumers in their categorization efforts. This chapter describes a study that used an online experimental auction and survey to determine whether or not category labels had an effect on consumers’ newness perception and willingness to pay for radically innovative products. The effect of providing labels of categories that differed in their degree of emergence on consumers’ willingness to pay for incrementally innovative products was measured in this study. In addition, the moderating effect of consumers’ innovativeness on the relationship between providing category labels on willingness to pay was measured.

The main finding described in Chapter 4, related to this theme, is that category labels that differ in their emergence have a different effect on consumers’ newness perception and willingness to pay. These findings suggest there must be a fit between the innovativeness of the product and the degree of emergence of the category label; providing a mature category label when advertising a radically innovative product has a negative effect on consumers’ evaluations. Future research could further explore the importance of the fit between innovativeness of the product and how that product is communicated. More specifically, it would be interesting to study the effect on consumers’ willingness to pay and newness perception of an innovative product that is explicitly compared to a product from an emerging category versus a mature category. Research could also study the effects on willingness to pay and newness perception of products that have radically innovative technologically features with a ‘retro look’, and vice versa.

6.1.4 Implications for Theme 4: Communicating category membership

The fourth theme relates to communicating category membership. Producers can signal the category membership of themselves and their

products by deliberately providing – or deliberately not providing – visual and textual category cues. Consumers may use category cues in order to decide to which alternatives the product should be compared to, which helps them to understand and judge the value of the product (Mogilner et al., 2008). Category cues can be textual and visual. Although studies in organization theory (e.g. Eisenman, 2013; Grodal et al., 2014; Petkova, 2007) and in marketing (e.g. Gregan-Paxton et al., 2005; Goode, Dahl, and Moreau, 2013; Moreau et al., 2001) have addressed the effects of category cues on consumers categorization, more knowledge is needed to provide a detailed understanding on the effects of category cues that communicate products' or producers' categorical identity. This thesis contributes to extant studies on category cues by providing conceptual clarity, proposing the concept of category markers (Chapter 3), and showing the importance of the correct use of category labels, as these can have an impact on product evaluation (Chapter 4).

Chapter 3 conceptually develops the concept of category markers. Category markers are category specific design characteristics that can be applied by producers to a product in order to reveal the categorical identity of the product, but that do not significantly affect the value of the product as a member of a particular category. Previous studies that examine the effect of category cues are often less clear on the conceptual understanding of category cues. Goode et al. (2013), for example, use category cues to refer to both brand names as well as the typicality of the overall design of the product. However, those cues might also signal other things, such as authenticity, and status, and might directly affect consumers' evaluations of the product. The concept of category markers provides a more nuanced concept to study the effect of design on consumers' categorization efforts.

The findings from Chapter 4 (see also section 6.1.3) show that category labels can signal a products' newness and can have an effect on consumers' willingness to pay. These findings contribute to studies on categorization by highlighting the importance of category labels, and demonstrating that category labels act as category cues, and they can directly influence consumers' newness perceptions and willingness to pay. Although this effect was studied at a product level, labels also play a role at a producer level because producers are labeled by others and by themselves. In the latter case, producers use category labels to position themselves in the market – for example by means of press releases (Pontikes, 2012) – which affects their organizational identity (Gioia et al, 2010; Ravasi & Schultz, 2006; Scott and Lane, 2000).

Future research could further investigate this category marker concept by examining the effect of category markers on consumers' categorization, willingness to pay, and newness perceptions when using or not using category markers. In addition, it would be interesting to study if and how the number of category markers influences consumers' evaluation and categorization of a product, and whether this depends on the degree of emergence of the product category, or if it depends on whether or not the product is spanning multiple categories.

6.2 Practical implications

The findings in this thesis provide interesting implications for practice. In general, the findings point towards the importance of the effects of categorization for producers. Categorization is especially important in cases where consumers are undecided about the categorical membership of products, because they are difficult to categorize or can be categorized into multiple categories, as is often the case with innovative products. Therefore, in this section the practical implications for producers who primarily focus on developing and offering innovative products are discussed. Based on the findings from this research, this section provides practical implications for the development phase of innovative products and the market phase of those products.

6.2.1 Practical implications for the development phase

The framework for classifying PSS' described in Chapter 2 is not only useful for scholars who study PSS'; it is especially useful for producers who are developing PSS' as producers seem to consider the realization of effective PSS creation a major challenge (Ulaga and Reinartz, 2011). This framework provides producers a useful tool to make decisions about combining the product and service elements that make an effective PSS. The first step is to identify whether or not the products and services that are being combined have autonomous value on the market. Second, producers should examine the degree of tangibility of interaction of the chosen products and services that they are planning to combine in a PSS. To develop a 'pure' PSS, there should be a high degree of tangibility (product elements) and a high degree of interaction (service elements),

which are valued by consumers. In addition, these products and services should be combined in a coherent, synergetic fashion.

During the development process of new products producers must make decisions regarding the visual design of the product. The results from Chapter 3 suggest that producers' design decisions are influenced by their competitive positions and the competitive context that they operate in. The concept of category markers is introduced, which designers can use to make strategic design decisions, since applying category markers to the design of a product will affect the way the market categorizes that product. Therefore, producers should carefully study the product categories in which they are planning to operate during the development process in order to a) identify the extent to which the category is emerging and b) identify the category markers. This can be done, for example, by comparing alternatives and identifying similarities in the products' design. No similarities or few similarities indicate that the category is emerging because no dominant 'visual' design has been established. In cases where producers can identify category markers, they may want to test them among consumers to check if these markers affect consumer categorization. Misidentifying category markers or using category markers in an inappropriate way can lead to mis-positioning products or to the occurrence of a classification gap (as studied in Chapter 5); this may have negative effects on product performance.

The results from Chapter 5 suggest that producers should assess whether there is a classification gap between them and their consumers. A classification gap exists when producers and consumers categorize the same product differently. Since such a gap can have serious consequences on the market performance of products, producers should try to prevent the emergence of such a gap by carefully investigating how consumers categorize their products and interpret certain category cues during the development phase. During the development phase of the product, producers should compare the perception of consumers to their own perception (e.g. by means of focus groups, interviews, or surveys); based on that comparison they should make decisions such that they and their consumers categorize the same product similarly. This is especially important for cases in which producers put radically innovative products on the market because those products are more difficult to categorize.

6.2.2 Practical implications for the market phase

Producers who put innovative products on the market might benefit by guiding consumers in their categorization efforts. Thesis describes two types of cues that producers can use to signal the categorical identity of new products. First, the concept of category markers was proposed, which are visual design elements that are applied to the product during the development phase. Second, the effects of category labels were discussed. Category labels can be used when advertising the product. The findings presented in this thesis highlight the importance of carefully selecting category labels when advertising new products. For example, the results show that by providing a mature label when advertising a radically innovative product, consumers' willingness to pay is negatively affected. Therefore, producers might benefit from carefully selecting labels and ensuring that those labels fit the innovativeness of the product.

Producers can accomplish this by conducting proper market research and identifying which category labels are used – and by whom – for the same product. As mentioned previously, in the early stages of a category many labels might be in use (Grodal et al., 2014), which makes it important to identify all of those labels make an informed decision about which labels to use. Moreover, identifying these labels is also important for preventing possible negative consequences of a classification gap that might occur if an inappropriate category label is used. If producers are familiar with the category labels that consumers assign to their products then advertising can be adjusted accordingly.

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Summary

The main aim of this thesis is to gain a better understanding of the effects of categorization when products can be categorized into multiple categories or cannot be clearly categorized into an existing category. This thesis focuses on products or producers that cannot be easily categorized because they are new. Insight from studies in organization theory and marketing literature on categorization are structured through four themes. The first theme involves the phenomenon of category spanning and the consequences of spanning multiple categories. Theme 2 relates to the phenomenon that different types of market actors might disagree on the categorical membership of the same product or producer. Theme 3 deals with the fact that categories are dynamic and evolve over time. The fourth theme relates to communicating categorical membership by providing – or not providing – visual and textual category cues. These four themes are addressed in four different chapters.

In Chapter 2 a framework for developing effective product service systems that span multiple categories is described and empirically tested. Chapter 3 introduces the concept of category cues and describes how producers' decisions to use these category cues are influenced by their competitive context and their competitive position. Chapter 4 explains how providing category labels that vary in their degree of matureness affect consumers' newness perceptions and willingness to pay. Finally, Chapter 5 proposes the concept of a classification gap and describes how such a classification gap has a negative effect on the market performance of a product. Based on these findings, practical implications are provided that will help producers to manage categorization issues, during the development and marketing phase of new products.

Samenvatting

Het voornaamste doel van dit proefschrift is om inzicht te krijgen in de effecten van categorisering wanneer producten gecategoriseerd kunnen worden in meerdere categorieën of wanneer producten niet duidelijk gecategoriseerd kunnen worden in een bestaande categorie. Dit proefschrift richt zich op producten en producenten die nieuw zijn en om die reden mogelijk niet gemakkelijk kunnen worden gecategoriseerd. In dit proefschrift zijn de inzichten uit studies in organisatietheorie en marketing literatuur over categorisering gestructureerd in vier thema's. Het eerste thema gaat over het fenomeen 'category spanning' en de gevolgen van het combineren van meerdere categorieën. Thema 2 heeft betrekking op de mogelijkheid dat verschillende soorten marktactoren het niet eens zijn over het categorie lidmaatschap van een product of producent. Thema 3 betreft het feit dat categorieën dynamisch zijn en evolueren in de tijd. Het vierde thema richt zich op het communiceren van een categorie lidmaatschap door middel van het al dan niet verstrekken van visuele en tekstuele categorie signalen. Deze vier thema's komen aan bod in vier verschillende hoofdstukken.

In Hoofdstuk 2 wordt een raamwerk gegeven en empirisch getoetst voor het ontwikkelen van effectieve product-dienstcombinaties die in meerdere categorieën geplaatst kunnen worden. Hoofdstuk 3 introduceert het concept 'category markers' en beschrijft hoe de beslissingen van producenten om deze categorie signalen te gebruiken worden beïnvloed door de competitieve context en de concurrentiepositie van deze producenten. In Hoofdstuk 4 wordt uitgelegd hoe het verstrekken van categorie labels, die variëren in de mate van volwassenheid, een invloed heeft op de perceptie van nieuwheid en de betalingsbereidheid van consumenten. Tenslotte, Hoofdstuk 5 introduceert het concept 'classificatie kloof' en beschrijft hoe een classificatie kloof een negatief effect heeft op het marktsucces van een product. Op basis van deze bevindingen worden in dit proefschrift praktische implicaties gegeven die producenten zullen helpen bij categorisering problemen tijdens het ontwikkelen en tijdens de marketing fase van nieuwe producten.

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Bram Kuijken is an Assistant Professor in Entrepreneurship and Innovation at the Amsterdam Business School, University of Amsterdam. In 2008 he received his Master's degree in Business Administration at the University of Amsterdam. After finishing his studies he worked for two years at the Marketing and Communication Department of the Faculty of Economics and Business at the University of Amsterdam, where he was responsible for the marketing and recruitment of international MBA students. In 2011 he decided to start his PhD at the Amsterdam Business School as part of the research program 'Creative Industries Scientific Program'. Bram has presented his work at international conferences on management and organization such as the *European Group for Organizational Studies Colloquium* and the *Academy of Management*. In 2014 he was a visiting scholar for two months at RMIT University in Melbourne, Australia. In 2015 Bram received the Take-Off grant from Technology Foundation STW to further develop his online research platform www.alleep.com, which focuses on gaining market insight for producers by selling their new products through an online sealed bid auction. The Take-Off program focuses on facilitating and stimulating entrepreneurship among entrepreneurial researchers from Dutch universities.

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- 2015 Take-Off grant from STW, 'Sales-based research: a new way to gather consumer insights'.
- 2014 First prize Insight Innovation Competition, IiEX North America 2014, for the most innovative online market research platform.

Journal papers under review

Kuijken, B., Leenders, M.A.A.M., Wijnberg, N.M., & Gemser, G. Mind the gap: differences in classification by the production and

consumption side of the market and music festival success. Under review (second round) at *European Journal of Marketing*.

Kuijken, B., Gemser, G., & Wijnberg, N.M. Effective Product-service systems. Under review (second round) at *Industrial Marketing Management*.

Organized conferences

13th PREBEM Conference 'Creativity and Innovation – Roadmap to the Future'. Hosted by the Amsterdam Business Research Institute (ABRI) from the VU University Amsterdam, and Amsterdam Business School (UvA). The PREBEM conference is organized for PhD researchers in Business Economics and Management.

Refereed conference papers

Kuijken, B., Gemser, G., & Wijnberg, N.M. 2014. Category markers: how organizations inform consumers about categorical identities of hybrid products. 74th Annual Meeting of the Academy of Management, Philadelphia, USA. August 1-5, 2014.

Kuijken, B., Wijnberg, N.M., & Gemser, G. 2013. Informing consumers about categorical identities of hybrid products: how market dynamics influence designers' choices. 29th EGOS Colloquium 2013, Montreal, Canada. July 4–6, 2013.

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