Bridging the gap between design and behavioral research: (Re)searching the optimum design strategy for brands and new product innovations

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Innovation, branding, and design are known to affect corporate success, but their interplay is not yet well understood. Companies need to take risks in developing new product innovations, whereas an established brand can serve as a familiar base to create recognition. However, designers are facing a serious challenge. Researchers in both fields study the existing world through abstract theories and "rules", instead of showing how to use these theories in practice. This study focuses on the relation between brands and innovations from a design perspective to create successful brand extensions. Gaining knowledge about the level of newness (novelty), level of familiarity (typicality), fit with the parent brand (brand fit), and expected market success (EM success), will support designers to create successful brand extensions. The study discusses 81 designs of snow scooters designed by students and evaluated by 47 experts by means of a quantitative and qualitative analysis. A multiple linear regression analysis is performed to show if brand fit, typicality, novelty, and (typicality × novelty) has an impact on the expected market success. The analyses demonstrate a significantly positive effect of brand fit on the expected market success \((p < .01)\). While the single effects of typicality and novelty were non-significant, the interaction between typicality and novelty showed a significant linear relationship on the expected market success \((p < .05)\). The results show the importance of the much-investigated balance between typicality and novelty, where brand fit seems to act as the suppressor for novelty and may be called \textit{brand typicality.}

KEYWORDS
brand extensions, consumer acceptance, new product innovations, product aesthetics, typicality

1 | INTRODUCTION

Over the last few decades, innovation management has become increasingly important for firms to secure their position on the market and to fuel growth (Keller & Lehmann, 2006). Innovation can drive profitability and growth and keep companies relevant for consumers. However, brand competition is intense. Companies need to take risks in developing new product innovations, but the likelihood of failures is ever-present. Introducing a new product innovation using an established brand name—a brand extension—provides for the reduction of risks of new product failure and avoids the costs of developing a new brand (Keller, 2013; Liao & Cheng, 2014). This strategy is...
widely accepted and can enlarge the chances of corporate success. It can create a positive spillover effect, depending on the realized quality level of the parent brand (Degraba & Sullivan, 1995). This "innovation from inside the brand" provides a more trustworthy way of introducing new product innovations. In short, a brand will help consumers evaluate product performance (Maheswaran, Mackie, & Chaiken, 1992) and the familiarity with the brand and its performance will give consumers more confidence (Sinapuelas, Wang, & Bohlmann, 2015). Notwithstanding the advantages of using an established brand name to increase the chances of success, it could also lead to failures. Introducing new product innovations can be a risky affair and lead to uncertainties about the acceptance of those new innovations, even when an established brand is connected to the product. Although 78 percent of new products introduced in 1998 were based on line extensions, their success rate (28%) was lower than the rate for new products (47%) (Ernst&Young & ACNielsen, 1999). This proves that launching a new product using an established brand name needs to be implemented carefully.

Due to the uncertainty of market success as described above, it is necessary to carefully investigate all aspects that influence the acceptance of new product innovations. The two research areas of brand management and innovation management that are described above are clearly strongly related, but their interplay is still underexposed (Brexendorf, Bayus, & Keller, 2015). Both fields have gathered a lot of knowledge about creating successful product innovations. However, our designers and design managers are facing a serious challenge here. Current literature on brand extensions focuses solely on answering the question how successful a certain product-brand combination will be (Aaker, 1990; Aaker & Keller, 1990; Bottomley & Holden, 2001; Völckner & Sattler, 2006, 2007) but does not say anything about the actual design of these brand extensions. These studies only show that a successful brand extension occurs when there is a "perception of fit" between the parent brand and the extension product. However, when a company has already decided what kind of innovation should be launched, the way this new product innovation is designed becomes the most important influencing factor. In fact, we can say that there is a third research field that is clearly involved in the interplay of creating new product innovations: product aesthetics. The aesthetic appearance of an object is an important determinant of success (Crilly, 2005) and creating these new product innovations involves a completely different approach.

1.1 | Approach of designers

In the field of product aesthetics, a different approach is used to come to the best solution compared to the field of science or humanities. Numerous studies about the working of designers support the view that there is a designerly form of activity that separates it from typical scientific and scholarly activities (Cross, 1982). The studies indicate that scientists are more trained to analyze a problem, whereas designers are more trained to find a certain solution by experimenting (Lawson, 2005). This is based on the fact that research in science studies the natural world, research in humanities studies the human experience, but research in design studies the man-made world (Cross, 1982). In fact, design is about the synthesis of all different kinds of knowledge. Designers can be designated as system thinkers to create a more holistic approach instead of combining the individual "parts" together to find the best solution. This difference in background will have an influence on how designers use the currently more rational or "scientific oriented" information in the fields of brand and innovation management. Let's zoom in again on the initial question: Why isn't the knowledge of the other fields working for designers? When all relevant information that will influence the success of a brand extension is known, such as the quality of the parent brand, the history of the parent brand, and the "fit" known as the relationship between the parent brand and the brand extension (Völckner & Sattler, 2006), it is still quite difficult for designers to translate the product characteristics and the values of a specific brand into a successful product innovation. How are we going to implement this general implicit rule that some level of fit is important? This level of fit can be implemented in numerous ways.

The information that is currently being investigated in the field of innovation and brand management has a central focus on the consumer instead of on the design of the product. Of course, they still describe the relation between the consumer and the product design, but they seem to focus on the behavior of the consumer. There is a substantial difference from this perspective, regarding the behavior of the consumer versus the design. The information needs to be related to the field of product design to be useful for designers in a way where they can use the information in order to achieve better synthesis (Figure 1). In other words, it is good to know what needs to be changed (rational consideration), but it is even more important that we know how something needs to be changed (synthesis).

![Figure 1](wileyonlinelibrary.com)
1.2 | Brand extensions and the interplay between three research areas

As explained above, a brand extension is a more secure way of introducing a new product innovation by using an established brand name (Kapferer, 2008). The definition of brand extensions can be described as a company using its existing brand name to launch new products in other categories (Kotler, 2000). In other words, designing a brand extension can bridge the gap between the areas of brand management (existing brand taking care of established knowledge) and innovation management (launching a new product in a new category) converging in the physical "form" of new product (product aesthetics). The current literature is quite clear that brand extensions provide for more certainty and can even cause a spillover effect (Degraab & Sullivan, 1995), but also come with risks of failure in the marketplace (Boon, Grant, & Kietzmann, 2016; Loken & John, 1993). However, as mentioned by Brexendorf et al. (2015), the interplay between these areas is really complex and there is still too little knowledge on how to effectively combine all research areas in the most effective way. In the following sections, we briefly discuss these shortcomings in relation to designing more successful brand extensions.

As explained in the brand management literature, many studies have been carried out on the successful effects of existing product-brand combinations (Aaker & Keller, 1990; Bottomley & Doyle, 1996; Bottomley & Holden, 2001; Vöckner & Sattler, 2006). However, they do not give any guidance on new product development and product management and on how the brand extension should be designed. How are we going to implement this general implicit rule that some level of fit is important? In the innovation management literature, the focus is more on different levels of innovation (Veryzer, 1998). Besides technological innovations, innovation can also be driven by a revolutionary change in the appearance and behavior of the design of a product, which might even have a more influencing effect (Verganti, 2009). The interplay within the field of brand management is interesting, but the link between the disciplines has not yet been established (Brexendorf et al., 2015). What role could brands fulfill in the adoption process of new product innovations? In the product aesthetics literature, the interplay between branding and innovation is barely addressed. Although product design and the aesthetics of consumer products are extensively researched (Berlyne, 1974; Crilly, 2005; Crilly, Moultrie, & Clarkson, 2004; Desmet, 2002), research on branding and innovation is scarce. However, design functions as a prior medium to influence consumers and shape their beliefs about products and brands (Bloch, 1995; Kreuzbauer & Malter, 2005). The process of translating abstract implicit core values into explicit characteristics is described by the semantic transformation method (Karjalainen, 2004; Karjalainen & Snelders, 2010). However, the semantic transformation of brand values into concrete product characteristics is a complex task for designers (Mulder-Nijkamp & Eggink, 2014). Between the product aesthetic literature and the innovation management literature, we find several studies (Hekkert, Snelders, & van Wieringen, 2003; Simonson & Nowlis, 2000; Whitfield, 1983) investigating the level of success using the MAYA principle (Loewy, 1951). This method can predict the success of new designs, while a design must be innovative on the one hand. On the other hand, still acceptable for the majority of consumers, in order to be successful. Combining these insights with the other research areas could lead to the more holistic approach that we are looking for.

In the design process, the decision made by designers and design managers determines the success of brand extensions to a large extent, and could lead to spending enormous amounts of money to launch new products that fail. In order to prevent more failures in this delicate and expensive market, it is necessary to gain a better understanding of the interplay between the three areas (Figure 1)—innovation management, brand management, and product aesthetics—focusing on a more holistic approach to the three areas. As also addressed by Brexendorf et al. (2015), we need to examine the complex and intertwined relationship between these areas with a specific focus on how specific design elements influence the adoption of new products.

We will extend the more general knowledge of all areas with insights that combine the three areas with a specific focus on how to design a successful brand extension instead of only focusing on what to design.

Design managers and designers will benefit from the knowledge that will give them guidance on how to implement brand extensions with certain brand characteristics to foster brand recognition and still create arousal among consumers. This paper leads to more informed decisions by designers and design managers on how to design new brand extensions when all other conditions are already defined (the brand, the product to design, etc.). The central question is: What factors in the field of brand management, innovation management, and product aesthetics, can be influenced by designers and impact the success of a brand extension?

2 | THEORETICAL BACKGROUND

In order to gain more insights on the important factors of the three research areas that can be influenced by designers, we need to focus on the process of designing first. Designers focus on the creation of artefacts where they need to translate (contradictory) requirements in several fields into one design, trying to find the best design solution. The more experienced designer possesses the ability to synthesize all knowledge into an artefact on a more intuitive level, based on their experience (Dorst, 2007; Lawson & Dorst, 2009). However, they can benefit from knowledge that helps them in this intuitive process.

As discussed earlier, the way of presenting knowledge in the fields of brand management and innovation management is focused more on the consumer. Hence, in this part, we will focus on the actual physical representation of the product and the kind of knowledge designers use. During their process, designers use methods and tools
to structure the process (Daalhuizen, 2014), but in general, they start experimenting at an early stage with all the ingredients of the design brief.

While designing a brand extension, several factors influence the adoption process, such as the quality of the parent brand (PB) and the actual fit of the product with the parent brand (Aaker & Keller, 1990; Völckner & Sattler, 2006). However, from a designer's point of view, there are only two “ingredients” that are relevant: (1) the fit with the parent brand (referred to as brand fit; linking of the utility of the PB to product attributes of the original product category) and (2) the extension: the creation of the physical appearance of the new product. The physical appearance is the most important transmitter of the initial message of the brand, and plays a relevant role in the decision-making process (Crilly, 2005; Crilly et al., 2004).

We will discuss the relevant literature regarding brand extensions from the designer's point of view, with focus on the aesthetic evaluation of the design. In this paper, we aim for a more structured and guided overview of their solution space, which can help them during their process.

First, we will discuss brand fit and the way in which the designer can benefit from it (Section 2.1). Second, we will discuss the creation of the new product where the MAYA method (Most advanced, yet acceptable) (Hekkert et al., 2003; Loewy, 1951) plays an important role by describing the factors’ typicality (Section 2.2), novelty (Section 2.3), and the interaction between typicality and novelty (Section 2.4).

### 2.1 Brand fit

The aesthetic appearance of a product is the main ingredient that fosters a strong visual identity for a brand (Stomphff, 2003) and builds meanings by creating brand values (Borja de Mozota, 2004). Design has a major impact on consumers’ purchase decisions, and influences the perceived meaning of the brand (Karjalainen & Snelders, 2010). As also stated by Homburg, Schwemmel, and Kuehnl (2015), brand attitude fully mediates the effect of aesthetics in product design with purchase intention, willingness to pay, and worth of mouth as dependent variables. Obviously, there must be some sort of connection with the parent brand, i.e., the product needs to be recognized by the consumer using concrete and abstract design attributes that communicate the core values of the brand. The brand fit we describe here is different compared to the literature of brand management. In the brand management literature, authors refer to fit, which is the similarity between the two involved product classes (Aaker & Keller, 1990; Bottomley & Doyle, 1996; Völckner & Sattler, 2006). There are only a few who refer to the influence of brand-specific associations (Broniarczyk & Alba, 1994; Park, Milberg, & Lawson, 1991), which can be defined as an attribute or benefit that differentiates a brand from its competing brands. The study of Park et al. (1991) finds that an evaluation of an extension is enhanced when the brand and the extension category share the same association, which they call brand concept consistency. They claim that fit is a function of two factors: product feature similarity and brand concept consistency. Broniarczyk and Alba (1994) even found that the brand-specific associations dominate the effect of product category similarity. In extension to the work of Broniarczyk and Alba, we will use the term brand fit to explain the brand concept consistency, which means the extent to which the concrete and abstract design attributes communicate the core values of the brand.

We argue that a strong relationship between brand fit and a new product innovation will support the adoption process, when the perceived meaning of the innovation is aligned with the perceived meaning of the brand. To achieve that, it is important that brand characteristics are consistently reflected in the design of the products and the product line to enhance the recognizability (Kreuzbauer & Malter, 2005). For brand extensions, the use of these recognizable attributes is even more important. A brand design requires a combination of existing brand-typical elements with design elements from the new product category (Leder, Carbon, & Kreuzbauer, 2007). Introducing a product in a completely different product category will evoke a novel experience for consumers, and at the same time, to assure the acceptance of the brand, it is important to connect to the identity of the brand and its core values to the product. The connection between the brand-typical elements and the brand values, in particular, has to be taken into account (Mulder-Nijkamp & Eggink, 2013). To illustrate this requirement, Figure 2 depicts two bikes designed for Ferrari. The design on the right only uses characteristic elements of the car which are more or less copied onto the bike. The design on the left is also using characteristic elements such as the air intake and the star shaped rims, and more importantly, the designers also tried to incorporate the core values of Ferrari (speed, agility, power), which leads to a powerful racing bike instead of a bike that looks more like an old fashioned bike—a velocipede.

The literature reveals that the brand attitude is a strong mediator in explaining the purchase intention and willingness to pay (Homburg et al., 2015). In particular, brand-specific associations are important in explaining the brand fit. We expect that the incorporation of brand fit (translating abstract and concrete attributes as well) will lead to a higher expected market success. We therefore hypothesize:

**Hypothesis 1.** The higher a design's brand fit, the higher its market success.

### 2.2 Typicality

An important factor that determines the success of a brand extension is the impact of the categorization principle, which is also adopted by several researchers (Loken & Ward, 1990; Meyers-Levy & Tybout, 1989). Is a product perceived as a typical design with regard to the main product category? The categorization principle means that a new product is classified as a member of a previously defined mental category (Barsalou, 1985; Loken & Ward, 1990; Vervry & Hutchinson, 1998). In other words, the designs in Figure 2 have to be recognized as a bike to be classified in the right mental category.
Moreover, for brand extensions, this means that the bike should be recognized as a bike, but should also have a fit with the categorization of the mother brand, the brand categorization. Consumers use their categorical knowledge of brands and products to simplify structure and interpret new designs (Meyers-Levy & Tybout, 1989). In the example of the less favorable Ferrari bike, we can say that the scheme of this product is distinguished as a bike, but probably not classified as a member of the known category of racing bikes. The brand product category as discussed by Kreuzbauer and Malter (2007) is not recognized by consumers in the design on the right, because Ferrari would never introduce a bike that looks like a velocipede, as visualized in Figure 2. The current literature shows that consumers first evaluate the affordances and the main category of a product, followed by the connection with specific brand sign categorization in combination with the main brand characteristics (Kreuzbauer & Malter, 2007; Leder et al., 2007). We argue that a recognizable brand product categorization, in combination with brand sign categorization, will lead to more successful brand extensions. Therefore, we hypothesize:

**Hypothesis 2a.** A high level of typicality together with a given level of brand fit, will lead to a higher expected market success.

### 2.3 Novelty

Novelty is strongly related to typicality and is classified by Berlyne (1971) in two categories: absolute novelty—which refers to an object that has never been experienced before—but in most cases it is relative novelty—which refers to a new combination of previously experienced design elements. When a design is perceived as relatively novel, it means that the combination of those design elements create arousal among consumers, resulting in an effect where consumers are more interested in the design and probably are tempted to choose the brand extension.

Several researchers have investigated the effect of novelty in consumer decision making (Bianchi, 1998; Blijlevens, Mugge, & Schoormans, 2012; Simonson & Nowlis, 2000) and have discovered that novelty leads to more success in the aesthetic appraisal of product design. A recent study found that products with high levels of product newness elicited more affective reactions (Radford & Bloch, 2011). This suggests that novelty is also an important predictor in the explanation of successful brand extensions.

As discussed by Kreuzbauer and Malter (2007), it is important to study the interaction between design innovativeness and the brand categorization processes. New product innovation balances between increasing the brand familiarity by implementing recognizable design attributes and creating arousal through the introduction of very novel design attributes that risk being unrecognizable as members of the brand category. We argue that the appealing brand extension design in Figure 2 uses the optimal balance in brand fit (the designers use a combination of concrete and abstract characteristics), prototypicality (it looks like a racing bike), and novelty (there is some newness in the design with regard to the frame of the bike).

In this study, we aim to provide evidence that besides brand fit and typicality, novelty is also an important variable to predict the market success of a brand extension. Therefore, we hypothesize:

**Hypothesis 2b.** A high level of novelty, together with a given level of brand fit, will lead to a higher expected market success.

### 2.4 Interaction between typicality and novelty

The majority of consumers have a preference for “typicality” in new product innovations (Veryzer & Hutchinson, 1998; Whitfield, 1983), while it is more adaptive for consumers to prevent risks and uncertainties. However, in some cases, the opposite effect is shown, and the designs with a more novel, distinctive appearance seem to be more successful (Bianchi, 1998; Simonson & Nowlis, 2000). This suggests that a simple linear gradient from novel to typical does not suffice to explain these effects. There are also studies that presented evidence for a moderate level of novelty that is preferred over both extremely typical and extremely novel products (Berlyne, 1974; Hekkert et al., 2003; Hung & Chen, 2012). The balance between both aspects seems to be the most optimal strategy to design for new product innovation.
This is known from the MAYA theory of Loewy (1951), where a successful design must be as innovative as possible, but not so much to be considered unacceptable. This finding has shown up repeatedly in many studies (Blijlevens et al., 2012; Hekkert et al., 2003; Whitfield, 1983). Hekkert et al. (2003) had a major breakthrough when they researched on consumer preference as a result of novelty (as in "as innovative as possible") and typicality (as in "goodness of example") as two separate indicators of two opposite poles. They found that there is a preference for the combination of both a high level of typicality and a high level of novelty, which will lead to higher aesthetic preference among consumers. Following this principle, a strategy to design for both novelty and typicality can be applied by using the design of different product attributes for either characteristic as proposed by Eggink (2010, 2012). For instance, a basic shape can be used to induce typicality, while at the same time, an unfamiliar choice of material can induce novelty in the same product. When designing brand extensions, one can optimize maximum novelty and typicality in a similar manner by thoughtfully using aspects of brand characteristics and product or brand categorization. As predicted by Berlyne (1974) as well, the multiplication effect of typicality and novelty as two linear functions may result in an inverted U quadratic function. And indeed, in a recent study, this effect was found by Hung and Chen (2012). Their study shows an inverted U curve between novelty and aesthetic preference for the product category chairs, where a moderate level of novelty is perceived as most beautiful. A limitation of this research, though, was that they used a bipolar scale for typicality and novelty.

In our study, we used brand fit, typicality, and novelty as independent scales to predict the success of brand extensions. The study re-investigates the research of Hekkert et al. (2003) and provides empirical evidence for the relationship between the interaction of typicality and novelty as independent variable and expected market success as dependent variable. The last hypothesis we would like to test is:

Hypothesis 3. The higher the level of novelty of a design with a given brand fit, the higher the effect of the design's level of typicality on market success.

We divided the hypothesis into three parts. First of all, we want to provide empirical evidence that brand fit (the aesthetic fit with the parent brand) is an important predictor of the expected market success. Second, we add the independent predictors of typicality and novelty, and finally, we add the interaction of typicality and novelty (Figure 3).

1. Expected market success = β0 + β2fit
2. Expected market success = β0 + β2fit + β2typ + β3nov
3. Expected market success = β0 + β2fit + β2nov + β3typ + β4typ x nov

After that we want to gain insight into the ratio between typicality and novelty to be able to predict the successfulness of brand extensions in more detail. By giving more insight into the acceptance of brand extensions and especially the ratio between typicality and novelty, we expect to offer information to designers that can be used to achieve an optimal combination in new product innovations.

3 | RESEARCH METHODOLOGY

3.1 | Development of stimuli

To investigate the factors that influence the success of brand extensions, we needed a lot of different designs from one specific brand and one specific product category. For the brand, we used the experience we built through the years by giving a masters course about creating brand extensions, based on an extensive brand analysis. Evaluating the results of the chosen brands, we indicated more implicit oriented brands (Google, Diesel, Aston Martin, etc.) and more explicit oriented brands (Ferrari, Porsche design group (independently working from the Porsche group) cooperating with leading manufacturers like Siemens that launched for example a specific Siemens Porsche line in kitchen appliances) and we saw brands using both strong explicit and implicit cues (Lamborghini, Dyson, etc.). Explicit cues are visual references in the design which can be pointed out like the hexagon shapes of Lamborghini (Karlojainen & Snelders, 2010). These explicit references are embedded in design features that designers implement with the intention to be recognized. On the other hand, the authors explain that implicit cues are visual references which are not immediately recognized. When these implicit cues are embedded in the design, they "make sense", like the rebellious character of Diesel. Consumers will inherently perceive and recognize these cues but in a more unconscious way (Karjalainen & Snelders, 2010). Using both explicit and implicit visual references in a design results in a more recognizable brand (Crilly, 2005; Karjalainen & Snelders, 2010). For novice designers it is also easier to embed explicit visual cues (like
the hexagon shapes), resulting in a strong implicit character (aggressive, fast cars). Therefore we decided to use a brand (Lamborghini) with strong explicit and implicit design cues (Crilly, 2005; Karjalainen, 2004) in their product portfolio and one specific brand extension to gain a lot of different designs from one brand and one product category. Within one brand, all brand-related effects (brand loyalty, brand recognition, etc.) remain the same.

To select a proper brand extension, we evaluated the dimensions of fit of Aaker and Keller (1990) and decided to design a snow scooter for Lamborghini with a focus on transfer. Transfer reflects the perceived ability of any firm operating in the first product class, to make a product in the second product class. We decided to use the dimension transfer, since as a predictor, this dimension is more important than the dimensions substitute and complement, and has a direct impact on the brand evaluations as discussed by Aaker and Keller (1990).

As a starting point, we made an artificial design brief to design a snow scooter for the brand Lamborghini. The assignment was given to 81 second year students in Industrial Design Engineering. They all designed the snow scooter in four weeks, during a concept sketching course where they learned to use a digital drawing tablet. The result was 81 different concept sketches of snow scooters which varied from really novel concepts to concepts that are quite typical (Figure 4). The results also varied in the quality of the drawings. There were results that were not completely finished, which seemed to be really unrealistic, and designs that were completely finished with a high level of realism (Figure 5).

All designs were presented in a portfolio with an environment-like background as shown in Figure 5. This environment, or the background in which the design is presented, can influence the perception of the consumer. Hence, first of all, we removed the background, so that the evaluator will only focus on the design. We selected the best 3D image of each concept in each portfolio and placed the design on a white surface in a picture measuring 7 × 7 cm.

The aim of investigating the relation with the expected market success is because aesthetic preference is largely determined by one’s own personal preferences of beauty and aesthetics (Bloch, 1995; Hekkert & Leder, 2008; Radford & Bloch, 2011). Ranking the most successful designs requires respondents to think about the actual acceptance by a larger group of consumers. Therefore, we had design professionals evaluate the designs. These professionals are trained to make decisions between several product alternatives and select the most successful designs.

3.2 | Data collection

The presented results were obviously not yet market ready. Therefore, we also decided to evaluate the design concepts by design experts, instead of regular consumers, because they are familiar with “evaluating” concept drawings and are also more capable of understanding the designer’s intent. It seems that professionals are better capable of processing new information because they have a more fine-grained conceptual structure. While judging new designs, they are able to classify new information better than non-professionals (Alba & Hutchinson, 1987). Due to their level of experience, they are the most capable target group for rating the expected level of market success of different designs for the consumer market.

We asked 47 design experts from different Dutch design agencies to cooperate in the experiment. Since there are 81 designs, this leads to some organizational problems, because one designer cannot rate 81 designs at once. To prevent the respondent being overwhelmed by the quantity of designs, we decided to make sets of 12 designs. The optimal number of images for comparison is seven (Dirken, 1997). However, in this experiment, we used 12 images, which were revealed one by one to enhance the overview of the respondents. In order to avoid biased results using the same sets of 12 designs, we also decided to reorganize the sets of designs, so in total there were 21 sets of different images ranked by 47 design experts. Every expert ranked 12 designs in about 30 minutes. During the experiment, the design experts were also asked to think out loud, so that we could use this qualitative data to underpin the quantitative results. Every session was recorded on tape and was used to investigate the most important categories people mention when they rank the items. In the end, all pictures were ranked at least six times by different experts. The ranking tool can be seen in Figure 6 and the setup of the interviews can be seen in Figure 7. Every single design expert ranked 12 different designs on a large screen. In the screen, there are two lines, the line at the right end with a plus symbol is the maximum result and the left line with the minus symbol is the minimum result (Figure 6). They were asked to position the designs together on five dimensions on a scale from 0 (not at all successful) to 1,000 (really successful) regarding market success, typicality (not at all typical to really typical), novelty (not at all novel to really novel), brand fit (does not fit the parent brand to does fit the parent brand), and aesthetic preference (I do not like the design to I like the design). The grey arrow above the picture is the point of measurement, so when two designs are above each other they are ranked similarly. The vertical axis in the representation does not particularly refer to anything but it helps respondents get a better overview of all designs. We emphasized that the respondents

**FIGURE 4** More conventional design of a snow scooter (left); novel design of a snow scooter (right) [Colour figure can be viewed at wileyonlinelibrary.com]
can use the complete scale from 0 to 1,000, but they were also allowed to use only a part of the scale if they thought that was better. We decided to use this absolute way of measuring the data to get more refined judgments (Oppenheim, 1992).

The procedure can be described as follows: We welcomed the respondents and asked them if they had any objections to being recorded. A short explanation of the procedure followed this and respondents were asked to rank 12 different designs based on the level of drawing quality and realism.
several dimensions (i.e., market success, fit, novelty, and typicality). They also received the 12 designs on paper in case they wanted to take a closer look or to rank all the designs by hand first. To be familiar with the ranking tool, the respondents were first asked to rank the designs on the quality of the drawing. This question is also important to control the drawing capabilities of the students. In the end, we can consider if the reliability of the design influences the outcomes.

In order to test the inter-rater reliability between the different raters, we calculated Cronbach’s alpha. Since we decided to use design experts instead of consumers, it was only possible to compare the outcomes of 47 design experts. This is because it was difficult to find experts in the field of design, who are able to find time in their busy schedule and were also willing to join our experiment. Considering their level of expertise and years of experience in the field of design, we appreciate their findings as more reliable compared to consumers, but it also leads to difficulties in testing the reliability of the different raters. The more formal method using ICC to test the inter-rater reliability was not possible in this specific case, because the respondents did not rank the exact same combination of images. The respondents deliberately ranked different sets of images to prevent the influence of certain combinations of images. The respondents deliberately ranked different sets of images to prevent the influence of certain combinations of images. In total, we have 21 combinations of images and every combination is tested by at least two different respondents. To underpin the reliability of the experiment, Cronbach’s alpha is calculated by measuring the means of the correlation between all respondents using the following formula (Cronbach, 1951):

$$\alpha = \frac{N \cdot r}{1 + (N-1) \cdot r}$$

where $N$ refers to the number of indicators (47 in total) and $r$ refers to the average indicator correlation. The Cronbach’s alpha of 0.73 indicates a reliable measurement (Nunnally, 1978). We are sure a lot of other design researchers cope with the same difficulties with a limited set of respondents and a lot of stimuli, so hopefully we can contribute to this problem by measuring the reliability in this way.

4 | FINDINGS

First of all, we investigated the Pearson correlation between typicality and novelty researched in the work of Hekkert et al. (2003). In this study, it was shown that typicality and novelty are jointly equally effective in explaining the aesthetic preference of consumer products, but they suppress each other’s effect. Products with an optimal balance of both aspects were aesthetically preferred.

In our study, as expected, the measurements showed a negative correlation of $-17$ ($p < .01$). The correlation between both items were not convincingly high compared to the results of the study of Hekkert et al. In the latter study, only the main ratings of all designs were calculated. When we calculate the means of every rating and also control the quality of sketching (by selecting the designs that have a rating higher than 500 for quality of drawing), we also measure a higher negative correlation between typicality and novelty of $-55$ ($p < .01$).

In the next step, we investigate if there is a significant relationship between the designs that use typicality and novelty in the most optimum way (i.e., maximizing both typicality and novelty) and the level of market success. Hence, the hypothesis states there is a linear relation between the interaction of typicality and novelty compared to expected market success.

A multiple linear regression analysis is performed using the software package SPSS to show if brand fit, typicality, and the interaction of typicality and novelty has an impact on the expected market success (Table 1). The analyses demonstrate a significantly positive effect of brand fit on the expected market success ($\beta = .571$, $p < .01$). However, typicality and novelty does not significantly impact the expected market success ($p = .396$ and $p = .159$ respectively). Nevertheless, the analysis shows a significantly positive effect of the interaction of typicality and novelty on the expected market success ($\beta = .114$, $p < .05$). While the independent outcomes of typicality and novelty does not reach a significant level, it is striking that the results of the interaction between typicality and novelty showed a significant linear relationship ($R^2 = .615$, $F = 177$, $p < .05$).

In Figure 8, the market success is plotted against the interaction of typicality and novelty. To plot this figure, we used the average measurements of all respondents. As explained in the development of stimuli, the designs varied in the quality of the drawings. There were results that were not completely finished, which seem to be really unrealistic and designs that were completely finished with a high level of realism. Therefore, we decided to rank all designs based on the quality of their drawings. We decided to divide the designs into three groups: low level of quality of drawing (average score between 0 and 333), medium level of quality of drawing (average score between 333 and 666), and high level of quality of drawing (average score between 666 and 1,000). To prevent miscommunication caused by the low quality of drawing, we only used designs with a medium and high level of quality of drawing (average score $> 333$). Hence, only

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Results of the multiple linear regression analysis with expected market success as dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coefficients</strong></td>
<td><strong>Unstandardized coefficients</strong></td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td><strong>B</strong></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>8.589</td>
</tr>
<tr>
<td>Typicality</td>
<td>.038</td>
</tr>
<tr>
<td>Novelty</td>
<td>.071</td>
</tr>
<tr>
<td>Brand fit</td>
<td>.565</td>
</tr>
<tr>
<td>Typicality × Novelty</td>
<td>.000</td>
</tr>
<tr>
<td>Quality of drawing</td>
<td>.185</td>
</tr>
</tbody>
</table>

*Dependent variable: expected market success
59 designs were plotted. The result of the graph in Figure 8 shows that more successful products indeed use a combination of higher rates of both typicality and novelty, compared to the less successful products.

There is a positive relation between the interaction of typicality and novelty and expected market success. It is possible that a specific design has a very high level of typicality and a lower level of novelty or vice versa. Therefore, we need to determine whether both typicality and novelty have to be optimized to create successful designs.

In the second step, we visualize the ratio between the level of typicality and novelty (horizontal axis) and market success (vertical axis) in more detail. As earlier, we only plotted the results with a medium and high level of quality of drawing (average score > 333), and filtered out the designs of poor quality (Figure 9).

The levels of typicality and novelty are divided into eight parts. The left part of the graph shows the more incremental designs with high typicality and low novelty (ratio of −1 to 0), the right part shows the more radical designs, plotted with high novelty and low typicality (ratio of 0 to 1). In between are the combinations with a high level of both typicality and novelty.

The plot shows an inverted U curve where the more successful designs are on the top or above the red line. When we take a closer look at the middle part of the graph, we can see there are the designs that have a high level of both typicality and novelty. The best designs use an almost similar ratio between typicality and novelty, with a remark that both levels of typicality and novelty have to be high. Design A39 uses an optimal balance between typicality and novelty, but both levels are relatively low (T = 247, N = 235) compared to B36 (T = 706, N = 637).

The graph also shows that more designs are plotted in the high typicality and low novelty part, which indicates that designers are more used to designing typical innovation instead of novel innovations. All the designs that use a high level of novelty and a high level of typicality do not seem to be successful. Designs A18, A39, B7, B31, A2, and A19 have a high level of novelty and typicality but are perceived as less successful products. A plausible explanation may be that these designs have more extreme styling and therefore are judged with a higher level of uncertainty regarding the performance of the product. In other words, they have recognizable characteristics of the product category of snow scooters, but they also have relatively extreme features that could have dominated the overall decision.

Finally, we need to investigate if the designs that are on top of the quadratic curve (all designs in the purple oval in Figure 9) are also the designs with the highest brand fit. The designs B36, B10, B6, B15, A2, and A3 all have a level of brand fit of 650 or higher. This corresponds with the outcomes of the correlation between expected market success and brand fit (0.74, p < .01).

In the right side of the graph, we see the designs with a high level of novelty and a low level of typicality. Can it also be true that the successful designs have a high novelty and a low typicality, but scored a higher level of brand fit? Hence the balance between typicality and novelty is still there, but now with a focus on brand typicality and novelty. Indeed, the designs above the red line (B33, A35, A13, A38, A8, A2, A40) have a relative high level of brand fit (higher than 550).
and the designs under the line (B14, A20, B19, A17, B31, A19 and B7) have a low level of brand fit and are therefore less successful. In other words, this suggests that when we optimize the balance between brand typicality and novelty, designs are also perceived as more successful.

In a 3D visual representation, we plotted the expected market success (z-axis) against the interaction between typicality and novelty (x and y-axes) (Figures 10a & b). The data of the expected market success is calculated from a regression analysis with the expected market success as dependent factor and the interaction between typicality and novelty as independent factor. In the analysis, we also calculated the unstandardized measurements. We transported this dataset into Excel and made a three-dimensional presentation of the results. In this visualization, we can see that the interaction of typicality and novelty leads to a higher expected market success. First of all, it is notable that the designs on the vertical line, which designates the negative correlation between typicality and novelty, all have comparable outcomes of the expected market success (z-axis). The real extreme typical or novel designs have slightly lower levels of expected market success. When we maximize both typicality and novelty, the graph shows a quadratic function. All designs above the negative correlation line of typicality versus novelty have a higher expected market success Figure 10b.

5 | QUALITATIVE RESEARCH

Besides a quantitative analysis, a qualitative analysis was performed to get a better understanding of the main research question: What factors in the field of brand management, innovation management, and product aesthetics, can be influenced by designers and impact the success of a brand extension? In the quantitative analysis we found a positive relation between the interaction of typicality and novelty. However, for designers this knowledge is less relevant. They benefit more from in-depth information, like how to deal with the balance between these two aspects. The ratio between typicality and novelty shows that these novice designers frequently choose the safe side, designing less novel designs. In addition, we also found that the designs with a high level of novelty and a relatively high level of typicality, scored below expectations. Probably these novel designs are perceived as less successful because of the high level of uncertainty regarding the performance. In this qualitative part we want to analyze the evaluation of the experts, especially focusing on the more novel designs. We want to investigate the various ways of interpreting the term novelty, in order to be able to give designers more relevant knowledge.

As already mentioned, the respondents were asked to think aloud during the process of evaluating the designs. We prepared a transcript of all the protocols and coded it using the program ATLAS-Ti (Muhr, 1991) and performed a qualitative content analysis (Mayring, 2014). The inductive category formation technique gave us an overview of the categories that were most relevant and made us rethink about the level of abstraction regarding the chosen categories (are they too specific or too general?). We examined how they interacted and related with each other.

In this paper, we will discuss our findings for the interpretation of the term novelty, as the definition of this term is still quite fuzzy (Hsiao & Chen, 2006; Hung & Chen, 2012). Novelty can be
seen "as the result of an overall appraisal of visual characteristics of a stimulus, including appraisals of how trendy, how curved and how complex it is" (Hung & Chen, 2012). Hsiao and Chen (2006) describe four important determinants of aesthetic appraisals: trendiness, complexity, emotion, and potency. The result of this appraisal leads to the evaluation of novelty: how different the stimulus is compared to a typical object of its category. The perception of product appearance is strongly related with categorizing the design into a specific group of products (Blijlevens, Creusen, & Schoormans, 2009; Bloch, 1995; Crilly et al., 2004; Loken, Barsalou, & Joiner, 2008; Loken & Ward, 1990).

The results of this study clearly show that, to a large extent, the respondents base their judgments on the categorization of the object (Kreuzbauer & Malter, 2005; Loken et al., 2008). Most of the respondents indicated that they compared the design to the prototype of a snow scooter looking for (the absence of) common attributes like two skis in the front and a caterpillar at the back. They also compared it with other product categories such as cars and motors ("These are a kind of motor-like-models that is of course quite innovative"). They also refer to novelty as being contemporary, and hence compare the character of the design with the current state of the art ("there are a number of them that have a bit of an old-fashioned character by choosing the wrong curve, that is just not contemporary and certainly not innovative"). This quote adds to the category of trendiness in forming a judgment (Hsiao & Chen, 2006). Another aspect is the level of complexity which was also mentioned in their work. When a design is too complex, it is regarded as too novel. The quality of drawing influences the judgement as well. If a drawing is not detailed enough, it relates negatively to novelty ("What a weird drawing, not so nicely drawn, a little shaky.").

We also found two categories that were not described as important factors to determine novelty (Hsiao & Chen, 2006;
Hung & Chen, 2012). Respondents relate to novelty with respect to the brand. They refer to the brand identity of the Lamborghini as being outspoken (“This one’s very conservative for Lamborghini; this one’s a little more outspoken. I’m going to look purely at the styling in terms of innovative”). If respondents refer to the brand identity when interpreting novelty, it may imply that the identity of the brand is seen as the suppressor value for novelty (typicality). Hence this might indicate that we can replace typicality with brand fit as stated earlier.

Furthermore, we also found that respondents relate to functional aspects (“I find this design to be innovative, because the motor is located in the front side” or “A very high one is quite new, but I still have questions about how that could work”) and usability aspects (“You can lie on this one, I can’t imagine that that’s already happening, but maybe I don’t know them well enough for that”). So, without physically interacting with the design, they form a judgment about the way it works. One of the most remarkable aspects of the results were the different ways respondents refer to the brand identity when evaluating novelty. We saw some respondents that refer to brand as the counter pole of novelty (“Yes, that’s innovative, but I can also see that it fits the Lamborghini brand”), referring to Figure 11 (left). Others refer to embedding the brand characteristics as the novel aspect in relation to the more archetypical designs (“Well, I’m just looking at what aspects such a design has, that isn’t really relevant to a snowmobile, so with this design I like the fact that they actually translated a part of the grill of the car that is very specific to Lamborghini into such a snowmobile”), referring to Figure 11 (right). In this last quote we noticed that the respondent described an explicit feature of Lamborghini as the novel aspect in the quite standard looking snow scooter.

From these qualitative statements, it is clear that designers need to take into account several aspects when they want to design a more novel product with a higher level of acceptance: the categorization of the object (the main form of the design should be recognizable), the trendiness (specific colors, forms and details on a medium or detail level that refer to the current trends are important), the level of complexity of the design (the design should balance between being not too complex or too simple), the performance/functionality of the design (the functionality and usability of a design should be clear) and the brand fit (referring to the level of novelty with regard to the brand). The last factor brand fit seems to act as a suppressor for the factor novelty.

There are two strategies to implement novelty in a design. The first one is designing a radical snow scooter, embedding more recognizable brand characteristics (like the grill) as the counter pole (Figure 11 left). The second strategy is designing a snow scooter which is based on a regular snow scooter, where the explicit features of the brand take care of the novelty in the design (Figure 11 right).

To conclude, we can say that the word novelty is still quite complex and this might have influenced the results in the quantitative study. Moreover, we also found that respondents used the brand to relate to novelty in different ways. Further investigation is needed to formulate a clearer definition for the term novelty.

6 | DISCUSSION AND CONCLUSION

In this paper, we tried to bridge the gap between three research areas by integrating the important determinants relevant for brand extensions (brand fit, typicality, novelty, and market success). Undoubtedly, there is awareness of the fact that a brand extension must fit the mother brand, but it is still underexposed how the interface of the brand and the innovations can be integrated. In order to support designers to create more successful brand extensions, we tested the integration of branding and innovation based on an evaluation of 81 snow scooter design concepts by 47 design experts.

6.1 | Theoretical implications

Theoretically, this paper contributes to the field of knowledge in brand extensions emphasizing the aesthetic appearance of new designs. The current literature on brand extensions focuses solely on answering the following question: what is a successful product-brand combination? However, it does not include any guidance on how to design the appearance of these brand extensions. Combining the literature of three research areas—innovation management, brand management, and product aesthetics—led to three important determinants relevant to designers in creating more successful brand extensions. One of the most important determinants that designers can use is the much-investigated relationship between novelty and aesthetic preference—the MAYA principle (Loewy, 1951), which was further developed by Hekkert et al. (2003) by claiming that “typicality and novelty are jointly and equally effective in explaining the aesthetic preference”. In this research, we build on this study specifically for brand extensions and extend the work by additionally considering products’ market success as the dependent variable. The results show a significantly positive effect of brand fit on the expected market

**FIGURE 11** (left) Novel design of a snowscooter using recognizable explicit cues of Lamborghini. (right) Regular design of a snowscooter using extreme explicit cues to make it more novel [Colour figure can be viewed at wileyonlinelibrary.com]
success and a linear relationship between the product of typicality and novelty, and market success. While the independent outcomes of typicality and novelty do not significantly impact the expected market success, the interaction between typicality and novelty does impact it. As an explanation for the non-significant relationship of the independent outcomes of typicality and novelty, we assume that one value might have functioned as a suppressor variable in relation with the other value. The interaction does show a significant relationship between both determinants and the interaction will make the effect stronger. This market success seems to be the largest when the interaction (product) of typicality and novelty is the highest and the ratio of both aspects is (almost) equal (B36 and A2).

### 6.2 Managerial implications

The results of this study can be important for designers as well as design managers to study the several effects to create new successful brand extensions. For product designers, a clearer definition of novelty related to the product appearance will provide useful information. This study provides them with visual examples that can function as a reference for their own search for novelty in design. Especially in the case of brand extensions, designers should be aware of the effect of novelty in the aesthetic appearance, because creating a product in another category might already be perceived as novel.

For managers, it may help them to plan strategic design decisions better. Overall, they should strive to maximize the product of typicality and novelty in their designs. However, there are still two possible strategies to follow to reach that goal: (1) they can start with a more “incremental” innovation as the main form—subsequently, they need to improve the level of novelty by adding novel elements on a medium or fine detail level (e.g., the steering wheel or the interface), or (2) they can design a more radical innovation as a main form and try to improve the typicality by adding recognizable brand characteristics on a medium and fine detail level.

### 6.3 Limitations of the research

The limitations of the research can be divided into four points: (1) the generalizability of the results, (2) the applicability for companies, (3) the complexity of the term novelty, and (4) the choice of professionals as respondents.

First, this study focuses on the relation between brands and innovations from a design perspective, in order to support designers to design successful brand extensions. However, we only investigated one brand and one product category. We need to further investigate the generalizability of the outcomes for other categories and brands in order to support designers in a better way. Furthermore, we used a lot of examples which sometimes had a low level of quality of drawing, which may have influenced the results.

Second, in this paper, we try to get insight on using various levels of typicality and novelty to design a successful brand extension. In general, these “rules” will help designers make deliberate decisions about the level of innovation of new products. Nevertheless, we also must indicate that the notion of novelty is relative—a discontinuous innovation for one organization might be an incremental one for another. In order to make the right decision for brand extensions and brand companies, a proper understanding of the type of brand/organizations is needed.

Third, the complex meaning of the term novelty might have influenced the results. Although we found a linear relationship between expected market success and the interaction of typicality and novelty, some of the design experts experienced difficulties in ranking the level of novelty. In fact, the definition of novelty is somewhat unclear and can be divided into several aspects from the affective response to product appearance. In the qualitative study, we noticed five different categories when ranking the designs on novelty (categorization, trendiness, level of quality of the design, brand identity, functionality/interaction). Some of the respondents indicated that they compared the design to the prototype of a snow scooter looking for (the absence of) common attributes like two skis at the front and a caterpillar in the end, in contrast to other respondents, who mentioned a technical innovation as an important aspect of novelty or the way of interacting with the snow scooter. This ambiguity could mean that there are differences between the rankings of novelty by consumers and needs further investigation.

Finally, another limitation of this research is regarding the evaluation of the designs with design experts instead of real consumers. Despite the fact that experts are trained to design products for consumers enabling them to indicate what is best suited, there is a possibility that these designers focus on the potential of an idea rather than on the design concept as such. In the next step, we validate the results to check if these results are comparable when we ask consumers instead of designers. In order to receive the most accurate results, we decided to use an absolute scale to rank all the items. In the ranking sessions, we explicitly emphasized using the entire scale. This way of ranking could be biased, as some respondents could be more conservative than others. Nevertheless, the IRR showed that the measurements are reliable.

### 6.4 Future research

Further research needs to consider the limitations mentioned above. The generalizability of the results needs to be improved by adding more product categories and different brands to support designers, bridging the gap between innovation and branding. Besides that, we strive to make the study more robust by getting more experts to test fewer designs and also by performing the same experiments with consumers. The selection of those designs will be by a pretest in order to eliminate less qualitative or suitable designs.

Moreover, we need additional studies to investigate the complex definition of the term novelty. In the qualitative content analysis, the results show a variety of different ways of interpreting novelty. As also stated by other researchers, the term can be interpreted in
different ways and should be developed as a multi-item dimension. What are the different aspects that may affect the evaluation of novelty? What is the relation of brand fit and novelty? How can we support designers with a better definition? In further studies we must investigate these questions and prepare specific stimuli to measure the responses to novel designs.

Future research will focus on elaborating the strategies that are mentioned in the managerial implications. We aim to gain a better understanding about the role of brand fit in the interaction between typicality and novelty. The factor brand fit seems to act as the suppressor for novelty and may be named as brand typicality. Further studies need to investigate this role of brand typicality as a combination of typicality and brand fit.

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