How do Consumers Think about Hybrid Products? Computer Wearables Have an Identity Problem

Highlights

- We explore consumers' perceptions of hybrid products using the example of wearables
- We classify computer wearables by perceived functionality and fashion type
- We study how permutations of these products impact a consumer's self-image
- We also explore the desirability of those different products
- We suggest positioning and merchandising tactics for wearables and other hybrids

Abstract

Hybrid products, as exemplified by Apple or Fitbit wearables, claim features of different product categories (i.e., a tech *and* a fashion item). As these products develop, marketers find it challenging to position and market them because they transcend traditional categories. Using wearables as an exemplar and utilizing the product design literature, we propose a typology of these hybrids using the dimensions of (1) mono- versus multi- functional and (2) mass- fashion versus luxury fashion. Mono-functional wearables, apart from being a fashion item, support one main technology- enabled function type (e.g., an activity tracker). Multi-functional wearables, in addition to being a fashion product, support multiple tasks: can for instance act as a watch, activity tracker and an organizer. To understand the optimal positioning strategies for wearables, we consider how various permutations of these products impact a consumer's self-image and product desirability.

Keywords: hybrid products, wearables, positioning, product design, self-image, symbolism

1. Introduction

Significant changes in the marketing environment due to new technologies are disrupting markets (Barczak, 2016). For instance, embedding technology into everyday products has yielded numerous complex and multi-functional hybrid products: products that possess features of more than one product category (Rajagopal & Burnkrant, 2009). Today we are witnessing an explosion of hybrid products such as *computer wearables.* These products feature a combination of sensors and/or computing devices embedded in apparel and fashion accessories, such as the Fitbit activity tracking bracelet or the Tambour Horizon smartwatch by Louis Vuitton (Friedman, 2017). The complex nature of computer wearables calls for product design, marketing and positioning approaches different from those used for traditional products.

Many industry observers believe the dual nature of these emerging hybrid products offers the potential to duplicate the success story of *athleisure* – the highly lucrative new category (as exemplified by the yoga pants we now see women wearing everywhere) that was created by combining athletic wear and leisure wear (Marlowe, 2016). However, the results for wearables are mixed at best, and thus far some wearable products have failed (Temple & Winchester, 2017).

How can we explain this lackluster consumer acceptance? One plausible explanation is that both manufacturers and consumers remain confused about how to think about and categorize these new items. Is an Apple Watch a tech product, a fashion product, a fitness product, or something else altogether? We saw a similar problem several years ago, when Motorola's personal digital assistant (PDA), a hybrid of a portable computer and personal organizer, failed to convince consumers of its value. Consumers had difficulty categorizing the device as a

portable computer or personal organizer because it shared some characteristics from each category, yet differed from other entrants in both categories (Keller, Sternthal, & Tybout, 2002).

The way that companies and users categorize products is tremendously important. This assignation results in a powerful self-fulfilling prophecy, as perceived category membership determines the criteria by which people evaluate the product, the competitors to which they compare it, and even where retailers display it in a store (Englis & Solomon, 1996; Chaplin & Lowrey, 2010). Is a rug furniture? Is a flavored yogurt a meal or a dessert? Is an Uber a taxi?

The answer is important, because it determines how manufacturers design and how retailers position products vis à vis consumer segments, and how they communicate brand attributes to appeal to different dimensions of self-concept. Rajagopal and Burnkrant (2009, p. 232) observe that the greatest issue regarding how shoppers categorize hybrids is a *"single category belief,"* where consumers assign a hybrid to an extant category and then evaluate it according to the determinant attributes they associate with that category. Thus, hybrids face a potential identity problem, because to date it is unclear whether consumers will see them first and foremost as technology or fashion products (Chuah et al., 2016).

Academic research on hybrid products, which could help address the identified questions, is still in its early stage. To date it primarily focuses upon visual and technology factors affecting cognition in relation to wearables, not on product categorization and its consequences for product design and positioning (e.g., Choi & Kim, 2016; Chuah et al., 2016). Especially because a bevy of hybrid products are poised to enter the market, it is important to develop frameworks that will help marketers to understand how to differentiate, position and display new hybrids to maximize the likelihood that consumers accurately apprehend and evaluate these new

product domains. As a step in this direction, we focus our inquiry on the case of one of the earliest hybrid offerings to come to market – computer wearables. Regardless the misfortunes of some wearable manufacturers (Temple & Winchester, 2017), this hybrid product category was estimated to reach over 27 million users in 2017 in the U.S. alone, with strong growth projections for the future (Statista, 2016; 2017). We aim to understand:

a) The dimensions we can expect consumers to use as they attempt to assign wearables to extant product categories

b) How hybrids will impact the consistency of a consumer's self-image (e.g., fitting with a self-image of Fashionista versus Tech Savvy person), considering the multiple needs they address;

c) How hybrids that differ in terms of how closely they link to a consumer's desired self-image will be readily adopted by users;

d) How to develop marketing strategies for wearables and potentially other hybrid products from a design and positioning perspective.

Our research program includes two studies. In Study 1, we look at the differentiating attributes of wearables and identify four product categories based upon a typology of (1) function/tasking type (mono- versus multi-functional products); and (2) fashion type (mass-fashion versus luxury). In Study 2, we employ a quasi-experimental design to explore how different types of products affect consumers' perceptions of self- identity and consequently their potential to bolster a desired self-image.

2. Theoretical perspectives on hybrid products: A rationale for further research

2.1. Categorizing and positioning of hybrid products

Hybrid products possess features of more than one product category, and therefore consumers potentially can assign them to multiple categories (Rajagopal & Burnkrant, 2009). Such products face the challenge of *"a single category belief,"* which means that consumers tend to assign them to a single preexisting category based upon their assumptions regarding the items the new product most closely resembles (Gregan-Paxton, Hoeffler, & Zhao, 2005; Rajagopal & Burnkrant, 2009). This tendency can diminish the appeal of a hybrid product, because it may not compete favorably with other items a store displays that may resonate more with a consumer's self-image.

In the case of the growing category of hybrids such as wearables, the task of positioning thus becomes more difficult. First, consumers might deal with multiple categories in relation to a product, for instance when they associate a smartwatch with extant cognitive labels including watch, activity tracker, fashion accessory, or organizer. Various product aspects, such as technological functionality or luxury materials, can be relevant because the relative salience of these dimensions will strongly influence the category that consumers choose (Solomon, 1988; Gregan-Paxton et al., 2005).

This assignment is crucial, because it determines the consumer's product comparison set (Solomon, 1988). Should the consumer for example compare (and a retailer emphasize the comparison of) an Apple Watch to his iPhone, to his Fitbit, or perhaps to a Tateossian bracelet or even a Rolex? How consumers assign a product to a perceptual category will also determine whether they will see that product as consistent with their daily lives, the tasks they need to perform, or the social roles they seek to play (Englis & Solomon, 1996; Chaplin & Lowrey, 2010). Understanding answers to those questions will help retailers and manufacturers of

existing hybrids to display those items in places and settings where consumers quickly build appropriate perceptions that will help the products to appeal to specific market segments.

3. Qualitative Study 1

In order to provide answers to the above questions, there is a need to understand how consumers are likely to perceive and categorize wearables. Furthermore, to understand the grounds for that categorization, we need to get deeper insights on the product attributes that affect consumer perception and product categorization. Given the embryonic state of knowledge in the area of hybrid products such as wearables, we start with an evolved grounded theory approach (Study 1) to collect and analyze observational data (Goulding, 2017).

3.1. Method

Evolved grounded theory follows the work of Straus and Corbin (1990). It emphasizes the structure, context, actions, and consequences that researchers can infer from qualitative data (Goulding, 2017). This methodology starts with data rather than with pre-existing theoretical frameworks that can bias researchers in the way they handle the data (Strauss & Corbin, 1990; Kumar & Noble, 2016). To analyze the data, researchers perform three types of coding: open, axial, and selective. Open coding is the initial step in data analysis that identifies and describes phenomena found in the text. Axial coding involves relating different codes to each other and pointing toward potential causal relationships among phenomena. During selective coding the researchers choose core categories to relate different codes to those core categories (Strauss & Corbin, 1990; Suddaby, 2006).

3.1.1. Data collection procedures

We relied upon consumer reviews (Rageh, Melewar, & Woodside, 2013) to evaluate perceptions of wearables, the most prevalent of the cross-category devices U.S. consumers currently use (Statista, 2016; 2017). We compiled these online reviews in December 2015. In order to select the products to review, we followed Kumar and Noble (2016) and examined 37 articles we sampled from the technology or fashion sections of popular magazines and databases *(Forbes, New York Times, Wired* and *WGSN*). We searched the contents of those magazines to look for articles with the following keywords: "fashion tech," "wearable technology," and "wearable device." This process yielded 29 distinct wearable products that included activity trackers, smartwatches, and smart clothing.

Table 1 shows all the qualifying products for which we collected reviews. For a sample of reviews, please see Table 2. In order for a specific product to qualify for inclusion in our analysis, the reviews of this item had to meet several criteria:

1) They must relate to different categories of wearables (different fashion and technology), with review comments pointing to differing attributes

2) They must include a minimum of 50 reviews

3) They must include a mixture of positive and negative comments, as indicated by a star rating of a review, where 1 star indicates a negative review and 5 stars indicate an excellent review. We tried to assure a good balance of all review types by collecting 10 reviews of each rating type (i.e., 1 star, 2 stars, etc.).

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3.1.2. Data analysis

We collected a total of 400 reviews (90,987 words). As suggested by Strauss and Corbin (1990), we coded the data independently following a rigorous process based upon the three types of coding: open, axial, and selective. Following the recommendations of Rust and Cooil (1994), we assessed coding reliability with a fairly good proportional reduction in loss (PRL) reliability indices ranging from 0.75 to 0.82 for open, axial and selective coding (e.g., in selective coding we considered classification into 1 of 4 categories: symbolism, ergonomics, function and aesthetic, with 2 judges and a proportion of inter-judge reliability of 0.75, achieving PRL index of 0.82).

We started by reading the collected materials and creating summative labels that described different product attributes, and their effect on product evaluations (open coding). Then, during axial coding we identified relationships between the open codes. The final step involved identifying the main variables that help to explain the relationships among the identified variables. The coding process resulted in the generation of a working model for a wearables typology. Following the work of Kumar and Noble (2016), we provide a few examples of the qualitative data, the coding, and the themes in Table 2 below.

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3.2. Results: Toward a typology of wearables

Our analysis of these reviews identified 2 key differentiating factors: (1) functionality of the wearable, differentiating wearables based on the number of tasks a device is able to perform,

and (2) fashion type of the wearable. Because both technical and aesthetic dimensions clearly play key role in consumers' evaluations, both the product design and fashion literatures are relevant to assist us in conceptualizing how users make sense of this hybrid category.

The product design literature distinguishes the following product characteristics that guide product design and differentiation: form, function, ergonomics and symbolism (Bloch, 1995; Luchs & Swan, 2011; Homburg, Schwemmle, & Kuehnl, 2015; Jindal et al., 2016). Product function relates to design characteristics that make a product functional and can increase its performance. Functionality in this sense would traditionally relate to technical performance, ability to perform and deliver certain tasks, such as activity tracking in case of wearables. Product form (aesthetics), on the other hand, relates to aesthetic characteristics of a product (e.g., shape, color, materials used) that attract and please consumers. The most common way to distinguish products based on this dimension is via a continuum that ranges from budget fashion to luxury (Horowitz, 1975; Liu & Choi, 2009; Hanslin & Rindell, 2014). Ergonomics relates to aspects of product design that make a product safe and user-friendly (Moon, Park, & Kim, 2014). While traditionally used in computer science or engineering, this dimension of product design is gaining more interest in the marketing literature due to the growing relevance of design factors on user experience (UX) (Jindal et al., 2016). Symbolism refers to the image a product communicates regarding a consumer's self-image both to the consumer and others, predominantly based upon a product's visual elements (Homburg et al., 2015).

3.2.1. Wearable typology

The qualitative analysis showed that both function and aesthetics are the basis for wearable differentiation. The primary functional theme we uncovered relates to the number of different tasks a device is able to perform. We distinguish between:

1. Consumers use *mono-functional products* to perform 1 specific type of activity (regardless of appearance). For example, a purse like the EmPowered bag that doubles as a cell phone charger falls into this category. Consumers evaluate such products in terms of how efficiently they perform the technology task for which they were designed and how they look.

2. Consumers use *multi-functional products* to support multiple tasks, for instance a hybrid product that acts as a watch, activity tracker and organizer (apart from being a fashion product). For example, the Levi Commuter Jacquard by Google is a jacket that also acts as a music player, connects to a smartphone and also acts as a navigation device. Multi-functionality supports various goals, such as productivity, social connectivity, or/and well-being.

In terms of aesthetic differentiation, while the fashion literature distinguishes among a range of different fashion types, e.g., luxury, designer brands, or mass-market fashion (Liu & Choi, 2009; Hanslin & Rindell, 2014), consumers tend to make a more simple distinction between either "luxury" or other "fashion" products, with the word "luxury" often used in product reviews to emphasize the difference. Consequently, we employ a dichotomy to describe fashion categories:

1. Luxury fashion products are those consumers perceive as exclusive. They possess brand heritage, prestige, rarity, and craftsmanship (Liu & Choi, 2009; Hanslin &Rindell, 2014). Such products are associated with premium prices, and consumers link them with the high social status of more affluent buyers.

Hybrid luxury products, while still rare among wearables, are distinguished by the reputation of the brand and the brand signature that signals heritage and a distinct historical positioning (e.g., the Apple Hermes smartwatch; Louis Vuitton Connected Tambour Horizon).

This product type is characterized by an elegant and unique look achieved through high craftsmanship and the expertise of manufacturing (Tynan et al., 2010; Kim & Kwon, 2017). Users expect such products to have the highest quality materials and design (e.g., diamonds, gold, silver, stainless steel, and genuine leather) that would contribute to uniqueness of the device and minimize the resemblance to other products or jewelry (Choi & Kim, 2016). This uniqueness justifies premium pricing (Stokburger-Sauer & Teichmann, 2013).

2. Mass-fashion products are those consumers perceive as more affordable and stylish. They reflect popular trends and are intended for mass-market distribution (Liu & Choi, 2009).

Wearables within this category are available to the average consumer at affordable prices. These products offer versatile style -- trendy and fashionable designs-- that can fit with different activities and lifestyles (Jung & Jin, 2014). Furthermore, users expect that some of these wearables can be worn as jewelry (e.g., the Bellabeat). The quality of materials here is based less upon their rarity and more upon performance (e.g., the device's weight or the extent to which it stretches or scratches the skin (Howarton & Lee, 2010). The brand image of certain products (e.g., Apple or Swarovski) is also associated with a certain level of fashion/trendiness.

Symbolism and ergonomics of mono-/multi-functional mass-fashion and luxury. While the main dimensions for wearable differentiation are function and form related, those characteristics also affect perceived symbolism and ergonomics of those products. Due to the fact that the majority of wearables are highly visible to other people, different consumers wear (or hide) these devices to communicate a desirable public image. They may communicate a strong lifestyle-related symbolic meaning that signals membership in a specific taste subculture, such as "Tech Savvy", "Health Fanatic" or "Fashionista".

For ergonomics it is important that those products are easy to set up and use, that they are comfortable to wear, and that they allow the user to personalize app interfaces or product displays. In terms of comfort, typical for fashion items, consumers stress that they want products that are safe and convenient to we ar. They seek wearables that will not scratch their bodies, and that will be secure when worn so they won't slip off easily. Ease of use is reflected in the availability of comprehensible set-up manuals and clear and easy to follow use instructions. Consumers also mention technical usability and use convenience factors, such as software performance, display readability, battery life and water resistance.

4. Consistency of self-image

The importance of self-product image congruency for product adoption is well-established in the consumer behavior literature (cf. Solomon , 2016). Some consumers prize status symbols such as luxury watches and jewelry from companies like Rolex, Hermès and Tiffany precisely because they sync with the social placement they occupy and/or desire. Even tech products are not immune to these pressures: Popular wisdom and even some empirical evidence, for example, points to the personality differences people impute to Apple versus Android users (Borreli, 2016). In fact, a survey of 20,000 people reported that iPad users are unkind and have little empathy; it labeled them a *"selfish elite."* It also described them as *"six times more likely to be wealthy, well-educated, power-hungry, over-achieving, sophisticated, unkind and non-altruistic 30- to 50-year-olds"* (van Buskirk, 2010). Given the relative novelty and rather muddy identity of hybrid products, the assignment of a precise *"brand personality"* (Fournier, 1998, p. 343) is far less straightforward. When both fashion and tech forces compete for ownership of a product's image, what will be the implications for their brand personality and the product's positioning strategy?

To address this issue we adapt consumption constellation methodology (Solomon, 1988; Englis & Solomon, 1996) to evaluate the consistency of self-images associated with the different types of hybrid products study 1 identified. The consumption constellation construct proposes that consumers internally represent social roles in terms of the set of products and services they associate with that role (this set is the constellation). Prior studies provide support for the notion that well-known social roles do in fact link to a consistent set of brands and lifestyle choices and that there is high consensus across consumers regarding these linkages. For example, in one study the researchers identified a constellation that participants identified with the "*Tree-Hugger*" social role: *"… vegetarian, environment lover,…super smart, but so laid back…wears Birkenstocks™, drives a Prius™, eats only organic food…"* (Chaplin & Lowrey 2010, p. 757).

An important aspect of a constellation is its' degree of *consistency*, which reflects the degree to which observers exhibit high consensus in their perceptions of the constellation elements that link to a specific social role (Englis & Solomon, 1995, p. 17). For instance, if we ask 10 people to categorize the Hermès brand and most of them link it to a "Fashionista" social role, this high consensus indicates strong consistency between the brand and a well-defined social role. This means that knowledge structures in relation to that product are very strong and we should expect that categorization will be relatively easy. The relative ease of cognitive accessibility for well-defined consumption constellations has been empirically demonstrated in both adults and children (Lowrey et al. 2001; Chaplin & Lowrey, 2010)

From a marketing perspective, high consistency is an asset when it is important to position a product so that it clearly fits with a given self-image (e.g., Fashionista). However, as consumers wish to convey multiple roles (Belk, 2013), could it be that in some cases they might

desire a self-image that is more flexible, and more representative of multiple dimensions of their social identities?

The question relating to the consistency of self-image as a reflection of social role depends upon the functionality (i.e., mono and multi) aspect of hybrid products. Items that are mono-functional will have fewer social roles associated with them and people who wear them (Gregan-Paxton et al., 2005). For instance, if we consider a Bellabeat bracelet, it is likely people consider it in terms of fashion and in terms of wellbeing; and its owners in terms of having primarily fashion or wellbeing-oriented selves. Multi-functional items, on the other hand, are likely to be associated with a greater number of product categories: e.g., an organizer, watch, wellbeing tracker, music player, etc. Consequently, its owners are likely to be associated with a greater number of taste subcultures and hence social roles. Therefore, we propose that:

H_1: Mono-functional products will exhibit higher constellation consistency than multi-functional products

While the mono-/multi-functionality of wearables might be an important indicator of potential self-image consistency, how it interacts with luxury versus mass-fashion products can affect self-image consistency. People consider luxury products to be scarce and unique, and thus they convey high status (Cristini et al. 2017). We tend to assume that owners of luxury products are more likely to be affluent and to appreciate the finer things (Joy et al., 2014). We propose that those assumptions are likely to dominate consumers' perceptions of hybrid products that represent the luxury (versus mass-fashion) category, and consequently affect perceptions of social roles associated with those products.

For mono-functional luxury hybrids, such as the Tory Burch bracelet, the luxury aspect will dominate observers' perceptions and make the perceived social role more specific when

compared to mass-fashion (e.g., an affluent person pursuing a healthy lifestyle versus a person pursuing a healthy lifestyle who can be anyone as is likely the case with non-luxury items). Thus, this elitist role associated with luxury will be easier to recognize and should have higher consistency than that associated with mass-fashion. In contrast, for luxury multi-functional products that are relatively unusual (cf. Chandon, Laurent, & Valette-Florence, 2016), consumers will not have readily available knowledge structures (product categories) so there will be less consistency across observers in case of luxury when compared to mass-fashion products. Hence, we propose that:

H_2: Perceived fashion status of a product (mass fashion versus luxury) will moderate the effect of product functionality on consistency of self-image associated with a given product in such a way that the hypothesized difference in consistency between mono- and multi-functional products (H1) will be stronger for luxury than for mass-fashion products.

Considering the varying levels of consistency of self-image associated with different wearable types, how are the differences affecting desirability towards being a member of those groups? Englis and Solomon (1995) specify that consumers tend to fall into one of these four groups when it comes to their associations with a given social role: occupied, aspired, avoided, and irrelevant. Belk (2013) claims that contemporary consumers often have multiple selves; hence they might prefer products that are flexible enough to allow them to convey multiple dimensions of social identity. For example, a cosmopolitan multi-tasker might gravitate toward a smartwatch that is versatile enough to fit in well during yoga class and on a date.

However, would that preference hold for luxury products, where the exclusivity we associate with this domain typically is the most dominant aspect? Luxury research indicates that some people can consume luxury, especially popular luxurious brands, to meet their self-

expressive goals and help them fit with elite aspirational groups (Kastanakis & Balabanis, 2014). In such cases symbolism and image conveyed by a product is very important as it supports status seeking, and often leads to *"bandwagon effects"* shopping patterns when people buy certain products because they wish to be seen as similar to others who consume the same items (Kastanakis & Balabanis, 2014, p. 2148). Consequently, if some consumers seek luxury items mainly for their symbolic meaning, more flexible devices may be less desirable. Consequently, considering group associations with a given social role (occupied, aspired, avoided, and irrelevant) and differences in symbolic meaning of different wearables, we propose:

H_3: Different products will be seen as more or less desirable, as indicated by association with a given group's social role, with multi-functional luxury showing the lowest desirability levels.

The overall conceptual framework in relation to our research is presented in Figure 1.

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4.1. Methods

3.2.1. Data collection

To ensure adequate sample size *a priori* power analysis using G*Power was performed. Using an alpha of .05, for a 90% power to detect effects with a medium effect size of Cohen's F = .25 in a 2 x 2 between group design, a minimum of 231 observations would be required (Cohen, 1988). A sample of 282 U.S. wearable owners was recruited through the online panel

Qualtrics. The sample was approximately representative of gender, major age bands, and the main U.S. regions, based on the U.S. population aged 18-75.

The study was a 2 x 2 between groups quasi-experiment with wearable categorization along the (1) functionality/tasking dimension (mono- versus multi-functional) and (2) fashion type dimension (mass-fashion versus luxury). Participants were randomly assigned to respond to one of four products representing different types of wearables: Bellabeat bracelet and Fossil smartwatch, representing mono- and multi-functional mass-fashion and Tory Burch bracelet and Apple Hermès smartwatch representing mono and multi-functional luxury.

We focused on existing wearables, when possible those explored earlier in study 1, so that we could elicit the most realistic perceptions of these devices. Our choice of luxury brands was limited to Tory Burch and Hermès wearables that were on the market at the time of data collection as these were the only brands that clearly fall into the luxury category (Wang & Griskevicius, 2013; Cavender & Kincade, 2014). Due to differences in functionality and luxuriousness, these products carried different price points. However, as we were not interested in behavioral but in perceptual outcomes in relation to these products, it was brand luxuriousness (versus its lack) and functionality (mono versus multi) that that were important to differentiate in the study design.

In the choice of mass-fashion brands, we tried to ensure that the selected brands were on a similar level of familiarity, as this factor could imprint in consumers' minds a popular rather than actually perceived social role. Thus, from the original list of wearables analyzed in study 1, we eliminated wearables that had over 5000 reviews at the time of data collection (Fitbit, Misfit shine, Samsung). Then, Fossil and Bellabeat were selected, as both wearables were the closest fit to our definitions of mono- and multi-functional mass-fashion.

Data collection procedures closely followed the methodology described by Englis and Solomon (1995). Each subject was asked to evaluate the social role and consumption constellation for 1 of 4 different wearables presented to them randomly. Subjects were first given a short description of a social role *("We sometimes associate certain types of people with the products and brands they use, as well as with a certain way of living (e.g., the way they spend their free time, preferred leisure activities, etc.). For instance, someone concerned about the environment can be referred to as "a green consumer", "Tree-Hugger", "environmentalist", etc. Such a person might drive a Toyota Prius, use Seventh Generation detergent to wash his/her clothes, prefer to spend their spare time hiking or supporting environmental initiatives (e.g., cleaning up polluted areas"*). They were also shown an image with 1 of 4 products (the same images as those presented in Table 1, plus an image of an Apple Hermès Watch representative of multi-functional luxury. The product became available on the market after study 1 was complete.

First, to confirm perceptions of mono-and multi-functionality of the selected products we asked participants to rate the products on their tech functionality: *"How do you evaluate the tech functionality of the product? Please indicate your answer on the sliding scale where 1 means limited tech functionality supported by the product, and 100 means a wide range of complementary tech functions supported by the product".* They also answered a question about familiarity with the wearable they were shown: *"How familiar are you are with the wearable you have just evaluated"*? (1-not familiar at all, 100 very familiar).

Then, they were asked to select a label of a social group whose members would wear the wearable they evaluated. Here, respondents were given a set of categories from which to select the label, and they also were given the opportunity to create their own label. The labels were

developed based on the wearable review data (study 1) and from a pilot study[1] . We used the following labels: (1) "*Gearhead (Tech Savvy person)",* (2) *"Health Fanatic",* (3) *"Fashionista",* (4) *"Gym Rat",* (5) *"Trend Setter",* (6) *"Control Freak",* (7) *"Other"* and (8) *"None of these"*. If option *"Other"* or *"None of these"* was selected, participants were prompted for further explanation. Then, they were asked to list the personal characteristics of a person likely to own the product.

To obtain a full picture of consumption constellations and better understand characteristics of different social roles, we showed participants the definition of social role again and asked them to list constellation elements for each product owner: his/her preferred leisure/work clothing brands, mobile applications and cars (Solomon, 1988; Englis & Solomon, 1995). After this task, participants answered the question related to their association with the social role they just described. They were shown the image of the product again and were asked to select a group membership based on the following question: *"People wearing this device represent the type of person…" "I would like to be", "I currently am", "I would NOT like to be", or "That has no meaning for me (It does not matter whether I am similar to or different from them)"* (Englis & Solomon, 1995). Then, participants were asked demographic questions and thanked for their participation.

[1] In order to pre-test the questions eliciting constellation elements and verify that the social role labels provide an exhaustive list of possible labels, we pre-tested the initial questionnaire with a sample of 52 students in a large US university (65% female/ 35% males, average age M = 21, SD = 2.94). The participants were rewarded with a course credit for their participation. In this study participants were randomly assigned to one of two wearables representing a combination of mono- and multi-functional mass-fashion and luxury: Tory Burch bracelet and Fossil smartwatch. The procedures they followed were similar to those described in relation to study 2. However, in the pilot study, there were 6 initial labels (developed by the authors based on the qualitative data collected in study 1): (1) *"Gearhead (Tech Savvy person)"*, (2) *"Health Fanatic"*, (3) *"Fashionista",* (4) *"Control Freak"*, (5) *"Other"* and (6) *"None of these"*. Those participants who selected option *"Other"* or *"None of these"* were prompted for further explanation. Based on this additional information provided by 7 respondents we added two additional labels: *"Gym Rat"* and *"Trend Setter"*.

4.2. Results

The sample consisted of 52% males/48% females. The average age of respondents was M = 38 years (SD = 14.45). The number of subjects exposed to different wearable type is presented in Table 3. There was no association between the dependent variable and age or gender of the respondents.

Then, we compared evaluation of mono- and multi-functional products. Since 4 different products were used, we used standardized scores. As expected, Bellabeat and Tory Burch were rated as less functional (M = -.13; SD = 1.03) than Fossil and Apple Hermes smartwatch (M = .13; SD = .96, t (280) = - 2.14, $p = .017$).

We also evaluated the level of familiarity with each wearable. As expected, there were no significant differences in how familiar participants were with these products ($p < 1$), with Tory Burch appearing as most familiar (M = .11, SD = 1.06), followed by Fossil (M = .02, SD = .92), Hermès Apple Watch (M = -.02, SD = 1.01) and Bellabeat (M = -.12, SD = 1.01). Thus, differences in familiarity with these devices should not affect consistency perception.

For hypothesis testing we used a frequency-weighted average of consistency scores in relation to social role labels and personality characteristics (Englis & Solomon, 1995). First, we calculated the frequency with which labels and personality characteristics were mentioned in relation to a given product. We used these frequencies (count) to weight individual label/personality type mentions. Then, each subject's responses were summed across each product type and divided by the total number of labels listed. This resulted in consistency scores that range from 0 (when no label/personality type was mentioned for a given product) to the maximum frequency (count) for a given label/personality type. We analyzed the data using the moderation procedure available in the PROCESS software (Hayes, 2013). Following the recommendations for main effects parameterization (Hayes, 2013, p. 277), we used dummy

codes for function (- 0.5 multi-functional; 0.5 mono-functional) and fashion (- 0.5 mass-fashion; 0.5 luxury fashion).

To test H1 and H2 we used 2 separate measures that differed in elicitation techniques: (1) labels describing social role selected from the preexisting label list, and (2) personality characteristics freely listed by participants (results are summarized in Table 3 and Figure 2).

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H_1 is supported as with both measures (social role and personality type), mono-functional products have significantly higher consistency measures ($M_{SocialRole} = 17.43$; $M_{PersonalityType} = 11.45$) than multi-functional products ($M_{SocialRole} = 12.53$; $M_{PersonalityType} = 8.03$; $\beta_{SocialRole} = 4.94$, $t(278) = 4.82$, $p < .001$, 95% CI = 2.92 – 6.96; $\beta_{PersonalityType} = 3.42$, $t(554) = 4.74$, $p < .001$, 95% CI = 2.00 – 4.83), as illustrated in Table 3.

Furthermore, the results support H_2. An interaction between functionality and type of fashion product point to differences in consistency between luxury and mass fashion products. For luxury, consistency is much stronger for the mono-functional wearable ($M_{SocialRole} = 19.80$; $M_{PersonalityType} = 12.24$) than it is for multi-functional wearable ($M_{SocialRole} = 12.19$; $M_{PersonalityType} = 7.46$; $\beta_{SocialRole} = 7.61$, $t(278) = 4.54$, $p < .001$, 95% CI = 4.31 - 10.91; $\beta_{PersonalityType} = 4.78$, $t(554) = 4.61$, $p < .001$, 95% CI = 2.74 - 6.81).

In the case of mass-fashion products, the differences in consistency are weaker, with the consistency of mono-functional wearables (marginally) significantly stronger ($M_{SocialRole} = 15.12$; $M_{PersonalityType} = 10.65$) than that of multi-functional wearables ($M_{SocialRole} = 12.86$; $M_{PersonalityType} = 8.59$; $\beta_{SocialRole} = 2.27$, $t(278) = 1.92$, $p = .056$, 95% CI = - 0.06 - 4.59; β

$_{PersonalityType}$ = 2.05, t(554) = 2.05, *p = .040,* 95% CI = 0.09 - 4.02). The interaction effects for both measures are illustrated in Figure 2.

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Place Figure 2 about here

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To address H_3, we looked at whether different products (with different consistency levels) are significantly associated with individual preferences for a given group/social role. We performed a cross-tabulation and followed it with a Chi-square analysis using the type of product and the group that participants specified they belong to as the variables of interest.

The distribution of group associations is presented in Table 4. While the Chi-square test points to no significant associations between the variables, the greatest differences between observed and expected values appear for the multi-functional luxury product category. Therefore, we performed log-linear analyses with main and interaction effects specified for the three factors: functionality/tasking type, fashion type and individual association in relation to a given group/social role.

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Place Table 4 about here

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The only significant interaction was observed for the aspired-to role (*I would like to be group*). As hypothesized, multi-functional luxury (the reference category) had the lowest desirability compared to multi-functional mass-fashion (*Estimate* = .71, z = 1.78, *p = .075*, 95% CI = -.07 - 1.51) mono-functional luxury (*Estimate* = .90, z = 2.14, *p = .033*, 95% CI = .07 -

1.73) and mono-functional mass-fashion (*Estimate* = 1.15, z = 2.07, *p* = *.038*, 95% CI = .06 – 2.23).

The results partially support $H_{3.}$ The hypothesized differences are not significant when we consider the product categories and 4 membership groups. However, the differences are significant for the aspired group category.

To provide further illustration of social roles linked to different wearables, we also calculated consumption constellations associated with different wearables, as presented in Table 5. The consumption constellation method was accompanied by correspondence analysis (CA), a multivariate mapping technique allowing understanding of the relationship between constellation element and each wearable. CA is a method of analyzing associations between columns and rows of a contingency table and representing those relationships as a perceptual map (Hartl, Hofmann, & Kirchler, 2016). Following Englis and Solomon (1995), to include product/brand as a constellation element it had to be listed as related to a given product by at least 15% of respondents who evaluated that product. To build a contingency table needed for CA, we calculated frequencies for all constellation elements that were mentioned by at least 15% of respondents in relation to at least 1 wearable. The frequencies added for the purpose of CA are highlighted in grey in Table 5.

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Place Table 5 about here

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The 4 x 23 contingency table representing relationships between wearables (4) and constellation elements (23) resulted in a 3-dimensional solution, a solution with maximum dimensions for this type of contingency table (Hair et al. 2008, p. 603), thus representing 100%

of the variance. Two-dimensional solution was considered first, as it explained 87% of variance, a satisfactory result. We opted for the 3-dimensional solution as it was easier to understand and explain than the 2-dimensional solution, and provided more insights in relation to the evaluated wearables, as illustrated in Figure 3 and explained below.

The first dimension (explaining 54% of variance, pointing to perceived complexity associated with mono- versus multi-functional wearables) groups Bellabeat (contribution to inertia [CTI] = .673), Apple Hermes (CTI =.199) and Fossil (CTI = .128) wearables with Toyota (CTI = .133), banking app (CTI = .130), Honda (CTI = .095) and stock app (CTI = .089). Interestingly, as Figure 3 illustrates, Bellabeat, Fossil and Apple Hermes are on opposite sides in this dimension, with Bellabeat linked to Target, Toyota and Honda, and Apple Hermes and Fossil linked to banking and stock apps. The second dimension (explaining 33% of variance, pointing to perceived tech innovativeness of wearables) groups Apple Hermes (CTI = .553) and Fossil (CTI = .264) with Apple store (CTI = .399), stock apps (CTI = .212) and BMW cars (CTI = .092). The third dimension (explaining 13% of variance, pointis to perceived fitness abilities/purpose of wearables) groups Tory Burch (CTI = .582) and Fossil (CTI = .361) with Under Armour (CTI = .238), Lululemon (CTI = .234), Nordstrom (CTI = .092) and Fitbit (CTI = .68). Interestingly, Tory Burch and Fossil again fall on the opposite sides of dimension 3, with Tory Burch showing stronger links to Lululemon Athletica, Nordstrom and Fitbit, while Fossil shows a strong association with Under Armour.

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Place Figure 3 about here

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5. Discussion

5.1. Theoretical implications

Our typology of computer wearables, building on the product design and fashion literatures (Homburg et al., 2015; Jindal et al., 2016; Kumar & Noble, 2016; Lacroix & Jolibert, 2017), specifies a new dimension of product functionality (mono versus multi). This aspect of functionality has not been previously considered in product design literature, which considers only generic functionality, aesthetics, symbolism and ergonomics as product design dimensions. Thus, our findings can inform future research, especially in relation to hybrid products, on how this new characteristic of functionality/tasking interacts with other typically considered product design factors, and thus affects consumer responses to hybrids. Furthermore, our findings point to the relevance of all of the above product characteristics in relation to hybrids, i.e., generic (traditionally used in product design literature) and tasking functionality, aesthetics, symbolism and ergonomics. This extends existing literature, which has focused on some (but not all) of those characteristics in relation to considered products. Jindal et al. (2016) for instance considers aesthetics, functional and ergonomic dimensions only, while Homburg et al. (2015) consider aesthetics, functional and symbolic characteristic. Researchers in the future need to give a consideration to the fact that different product types will be differentiated by and desired for a different set of product characteristics.

In the context of fashion, the new type of tasking functionality is even more important. The idea of multi-functionality, mainly in relation to luxury items, is an important addition to the luxury literature, which has emphasized limitations of theoretical frameworks in its ability to differentiate between luxury products (Chandon et al., 2016).

Another finding of our research is that flexibility of self-image is more likely to be experienced with multi-functional products. Ironically, while there is interest in launching luxury wearables, it appears that manufacturers may diminish the status appeal of their products when they add the extra functionality many consumers seem to desire. As these hybrid products morph into multi-functional tech platforms, they may lose the capacity to signal uniqueness, craftsmanship and style consumers typically associate with luxury. Consequently, while multi-functional luxury could appear as a new product category that could help some consumers to detach from the stigma of conspicuousness sometimes associated with luxury products (Berger & Ward, 2010; Janssen, Vanhamme, & Leblanc, 2017), more research is needed to ensure that the combination of tech and luxury does not compromise identity and values buyers typically associate with luxury (Friedman, 2018).

5.2. Managerial implications

Considering the opportunities and challenges associated with marketing of wearables, also failures of some of these devices (Temple & Winchester, 2017), our research findings can help organizations involved in wearable design and marketing to adjust their design and positioning strategies to maximize the likelihood of consumer adoption. First, in terms of wearable design, users perceive those products as both digital devices and fashion accessories. Customization should not only involve the functional features but should also comprise the aesthetic form of the device. In addition, wearables should be designed with consideration of symbolic and ergonomics features. Designing and communicating the value proposition of such devices could emphasize the differentiation afforded by our typology, as explained below.

Companies that sell wearables in the broad categories of mass-fashion and luxury should pay close attention to the distinction between mono- and multi-functionality. Based on our

results it appears that for luxury brands it might be worthwhile to invest resources in developing technological advancements (both functional and ergonomic) in relation to mono-functional products. Those companies could identify other tech functions that could be embedded in their products and make a separate mono-functional product that delivers each function. For instance, those companies could try to understand their consumers better and see whether there are unique needs that could be satisfied by mono-functional wearables. For instance, is there a need for a satchel bag acting as a game console or a presentation center (bring your bag with you to a work meeting and do not worry about technical difficulties ruining your presentation). Is there a need for a fertility center enabled by earrings with the ability of tracking basal temperature (pointing to the time when coupled should seek/avoiding intimate relations, depending on their objectives, see Caddy, 2018) through an ear insert? Considering the fact that fashion consumers tend to have multiple products within the same product category (e.g., bags, belts, earrings or shoes), this could be a good way of launching other mono-functional luxury products. These products are still likely to communicate the uniqueness associated with luxury as the functionality will be less likely to overshadow luxuriousness of a product. Caution should be paid to designing multi-functional luxury wearables and use of attributes pointing to multi-functionality. It is possible to design a luxury smartwatch but continue to stress the design attributes that emphasize the device's luxury rather than its advanced technical qualities.

Companies that sell mass-fashion wearables could also use the mono- versus multi-functionality dichotomy to their benefit. It appears that both types of wearables are desirable to consumers. Consequently, the principles in relation to mono-functional luxury will also apply to mono-functional mass-fashion. Those companies could also aim to identify various tech functions and make various separate mono-functional products delivering those different

functions. Multi-functional mass-fashion products, while generally desirable, could look into expanding the areas of multi-functionality following the suggestions for mono-functional products (and ensuring that this functionality is emphasized with the use of appropriate product attributes).

Our research findings offer insights relating to marketing efforts that could support product positioning and merchandising to target wearables to a selected consumer group (i.e., appeal to a desired self-image). First, understanding product constellations, especially those closely related to a specific wearable as indicated by the CA analysis, enables marketers to design retail settings that position the product with other products/vendors that are members of the same constellation and can make product categorization easier for shoppers. For instance, it would be effective to place Fossil or Tory Burch wearables in Macy's or Nordstrom stores in the active section of a store, next to Under Armour and Lululemon Athletica respectively. Our results clearly show that consumers are knowledgeable about high-end products (as we see in the growing use of the term mass-luxury; Kastanakis & Balabanis, 2012) and thus they expect to see those products in different stores, not only the most exclusive ones. However, those principles would less likely be effective for multi-functional luxury, such as Apple Hermès. Before more research emerges about those products, the safest approach most likely is to stick to an upscale (jewelry or watch) positioning strategy.

Brands could also build on the idea of constellation congruency to make product licensing decisions. For instance, manufacturers can enter licensing agreements with other brands or retailers that belong to the same consumption constellation. Thus, a fashion/health-oriented product brand (e.g., Tory Burch) might become a licensed supplier of wearables to a fashion/health-oriented apparel store (e.g., Lululemon). This study can also help marketers

identify optimal co-branding alliances, a common strategy used by companies to respond to the fast-changing marketplace (Voss & Mohan, 2016; Shen, Choi & Chow, 2017). For instance, Fossil and Under Amour could launch a special line of accessories that would use technology enabled by sensors embedded in textiles.. Those companies could also develop a new edition of a smartwatch that would target both stylish and active consumers. Therefore, this methodology provides insights to marketers on the right partners to consider. Again, those principles would not apply to multi-functional luxury products.

5.3. Limitations and future research

While our analyses aim to address hybrid products in general, we focused on a small sample of wearable products that were available at the time of data collection; therefore future research should look at other types of hybrids. Furthermore, data collection was limited to one country, the U.S., where wearables appear to be a well-recognized type of product. Hence, considering the fact that new hybrid products are constantly appearing on the market, future research can look into characteristics of such new products, as well as those outside of the American market.

A natural extension of this work would be evaluation of consumer behavior (e.g., purchase or adoption intention) in relation to different hybrid categories. The product characteristics this paper describes (function/tasking ability, generic function, aesthetics, symbolism and ergonomics) and their effects on purchase intention could be evaluated in mass-fashion and luxury products, especially those that are multi-functional. Results of such studies could inform mass-fashion and luxury designers interested in hybrids on the best balance of fashion and technology for the most favorable consumer responses.

Finally, as the hybrids market expands (perhaps exponentially) and the industry asks consumers to choose among more multi-functional items, the proliferation of these devices will exacerbate crucial positioning issues for marketers. As a smartwatch or another smart accessory waiting in the wings (perhaps a chip implant?) becomes a control center of a person's life and consumers install hybrids in their homes, work or cars marketers will need to understand how consumers approach this connected world.

We might need to broaden our product typology, differentiating between multi-functional hybrids that are wearable (or implanted) from those that reside in our appliances, furniture and cars. We will need to understand how evaluative dimensions such as symbolism, ergonomics, function and aesthetics influence our connections to these hybrids. The brave new world of hybrids poses numerous challenges for marketers, but also exciting opportunities for those manufacturers, advertisers and retailers that can crack the code to understand how consumers of the future will relate to the devices in, on, and around our bodies.

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List of Tables

Table 1
The set of qualifying wearables

Bellabeat Leaf	Samsung Gear S2 Classic	Fossil Q	Apple Watch
			
Misfit Shine	Swarovski for Misfit Shine	Fitbit Flex	Tory Burch for Fitbit Flex
			

Table 2
Example data from qualitative data collection.

Qualitative data example and data source	Open codes	Axial codes	Selective code
"I am a fashion addict I like being stylish and this Tory Burch bracelet is perfect for me!"	Fashionista	Lifestyle symbols	Symbolism
"It will be great once these smart watches are less expensive in the future but this is a good buy for tech savvy individuals".	Tech Savvy		
"I bought the Leaf because I wanted to have a healthier lifestyle, stay more focused on my health goals and the Leaf is exactly what I needed for the extra push!	Health Fanatic		
"I love my Fitbit Flex. I bought this model for several reasons: I'm a fairly active person, but I don't always have time to go for a run or to the gym. I wanted to be able to monitor my daily activity, steps/distance, intensity levels...etc.,	Activity tracker	Main function benefits	Function
"This smart watch has some nice features on it. Notifications help me out a lot from missing phone calls and text messages. It is great for exercise, walking and running. A lot of nice watch faces".	Call receiver and activity tracker	Multi-function benefits	
"I like the way it looks on my wrist".	Look and style	Styling benefits	Aesthetics
"The pendant is pretty. The pendant is reversible so one can wear it on the other side, which is plain and modern".	Pretty and modern		
"I bought one for my son and he really likes it. I love the style on him (black with black strap). The only thing I wish is that the women version should have smoothy corners like the men's".	Smooth corners		
"At first I was a bit skeptical and didn't wear it all the time except for some special occasions because it's a really nice piece of jewelry".	Piece of jewellery	Uniqueness	
"First look, it was amazing, the box that it came in was designed to the detail, and it gave the apple watch a very luxurious look, but with it being over $500 it better be".	Luxurious look		
"It is quite difficult to navigate".	Interface	Ease of use	Ergonomics
"Set up online was easy. I didn't miss a paper manual because the online manual is complete and easy to access.	Set up		
"The battery life is fantastic - 7 days, - the filtered notifications means that it only notifies you of the information you want it to".	Battery life	Usability factors	
"The software can always be improved and that's what Fossil needs right now for the Q platform".	Software performance		
"It provides good basic information without needing a bulky display".	Display readability		
"It's not water resistant and I always have to be careful not to get it wet when I am washing my hands".	Water resistance		

Table 3
Consistency measures

	Mass fashion				Luxury fashion			
	Mono-functional (Bellabeat) n = 72		Multi-functional (Fossil smartwatch) n = 70		Mono-functional (Tory Burch) n = 71		Multi-functional (Apple Hermès smartwatch) n = 69	
Social role: label choice %								
	Health Fanatic	35	Fashionista	47	Fashionista	24	Trend Setter	28
	Fashionista	24	Trend Setter	19	Trend Setter	24	Fashionista	20
	Gym Rat	10	Health Fanatic	11	Gearhead	20	Gearhead	15
	Trend Setter	10	Gym Rat	6	Health Fanatic	13	Control Freak	15
	Gearhead	7	Gearhead	6	Control Freak	7	Health Fanatic	10
			Control Freak	6	Gym Rat	2	Gym Rat	4
Mean (SE)	15.12 (1.00)		12.86 (1.01)		19.80 (1.02)		12.19 (1.02)	
Model summary: R^2 = .11, F (3; 278) = 8.12, $p < .001$								
Fashion (FS)	Coefficient = 2.00,		SE = 1.02,	t = 1.95,	$p = .052$,	95% CI =	(- 0.02; 4.02)	
Function (FN)	Coefficient = 4.94,		SE = 1.02,	t = 4.82,	$p < .001$,	95% CI =	(2.92; 6.96)	
FS * FN	Coefficient = 5.36,		SE = 2.05,	t = 2.61,	$p = .009$,	95% CI =	(1.31; 9.38)	
*Personality type: free elicitation %								
	Active	40	Stylish	23	Stylish	42	Professional	29
	Stylish	16	Professional	19	Active	17	Wealthy	22
	Fit	11	Wealthy	19	Cool	17	Stylish	16
			Nice	17	Wealthy	15		
Mean (SE)	10.65 (.72)		8.59 (.71)		12.24 (.72)		7.46 (.71)	
Model summary: R^2 = .05, F (3; 554) = 8.49, $p < .001$								
Fashion (FS)	Coefficient = 0.23,		SE = 0.72,	t = 0.32,	$p = ns$,	95% CI = (- 1.18; 1.65)		
Function (FN)	Coefficient = 3.42,		SE = 0.72,	t = 4.74,	$p < .001$,	95% CI = (2.00; 4.83)		
FS * FN	Coefficient = 2.72,		SE = 1.44,	t = 1.89,	$p = .059$,	95% CI = (- 0.11; 5.55)		

* Free elicitation resulted in many labels listed by respondents. While in the consistency analyses we used all the labels, this table reposts labels most relevant for a given social role, i.e., mentioned by at least 15% of respondents (Englis & Solomon 1995)

Table 4
Association with group/social role

	Mass-fashion		Luxury fashion	
	Mono-functional (Bellabeat) n = 72	Multi-functional (Fossil smartwatch) n = 70	Mono-functional (Tory Burch) n = 71	Multi-functional (Apple Hermès smartwatch) n = 69
I would like to be (aspired group)	40%	41%	37%	23%
Observed/Expected count	*29/26*	*29/25*	*26/25*	*16/24*
I currently am (occupied group)	22%	14%	24%	17%
Observed/Expected count	*16/14*	*10/14*	*17/14*	*12/13*
I would NOT like to be (avoided group)	13%	7%	10%	14%
Observed/Expected count	*9/8*	*5/8*	*7/8*	*10/8*
That has no meaning for me (irrelevant group)	25%	38%	29%	45%
Observed/Expected count	*18/25*	*27/24*	*20/24*	*31/23*
Chi-square = 13.43, p < 1, Cramers' V = .13, p < 1				

Table 5
The content of product constellations elicited in relation to wearables

	Bellabeat n = 72	%	Fossil n = 70	%	Tory Burch n = 71	%	Apple Hermes n = 69	%
Stores	Target	28	Macy's	16	Macy's	30	Macy's	27
	Walmart	25	Nordstrom	13	Nordstrom	18	Apple	25
	Macy's	14	Target	7	Walmart	15	Nordstrom	16
	Apple	7	Walmart	7	Target	14	Target	12
	Nordstrom	1	Apple	0	Apple	4	Walmart	9
Leisure clothing	Nike	43	Nike	44	Nike	41	Nike	45
	Adidas	21	Under Armour	30	Adidas	20	Adidas	29
	Under Armour	15	Adidas	19	Lululemon	15	Under Armour	20
	Lululemon	3	Lululemon	6	Under Armour	11	Lululemon	4
Mobile apps	Social media app	42	Social media app	37	Social media app	34	Social media app	35
	Health/track app	32	Banking app	26	Shopping app	27	Banking app	22
	Shopping app	22	Health/track app	26	Health/track app	25	Health/track app	17
	Facebook	*20*	Shopping app	21	Banking app	17	Stock app	16
	Banking app	1	*Facebook*	29	*Facebook*	25	Shopping app	16
	Stock app	0	*Instagram*	19	*Instagram*	*20*	*Facebook app*	26
	Fitbit	14	Stock app	3	*Fitbit*	*18*	*Instagram*	*9*
	Instagram	11	*Fitbit*	9	Stock app	1	*Fitbit*	*7*
Cars	Toyota	29	BMW	38	BWM	25	BMW	19
	Honda	21	Mercedes Benz	27	Mercedes Benz	25	Mercedes Benz	19
	Chevrolet	15	Lexus	13	Honda	17	Lexus	16
	BMW	10	Toyota	10	Toyota	14	Chevrolet	12
	Lexus	7	Honda	6	Lexus	13	Toyota	9
	Mercedes Benz	7	Chevrolet	6	Chevrolet	6	Honda	6

Product characteristics constituting at least 15% of responses for a wearable to each type of question are included
Shaded area represents constellation elements not reaching the cut-off value of 15% for a wearable in case where the constellation element reached that cut-off value for another wearable. Those values were needed for correspondence analysis.

List of Figures

Figure 1
Proposed conceptual framework

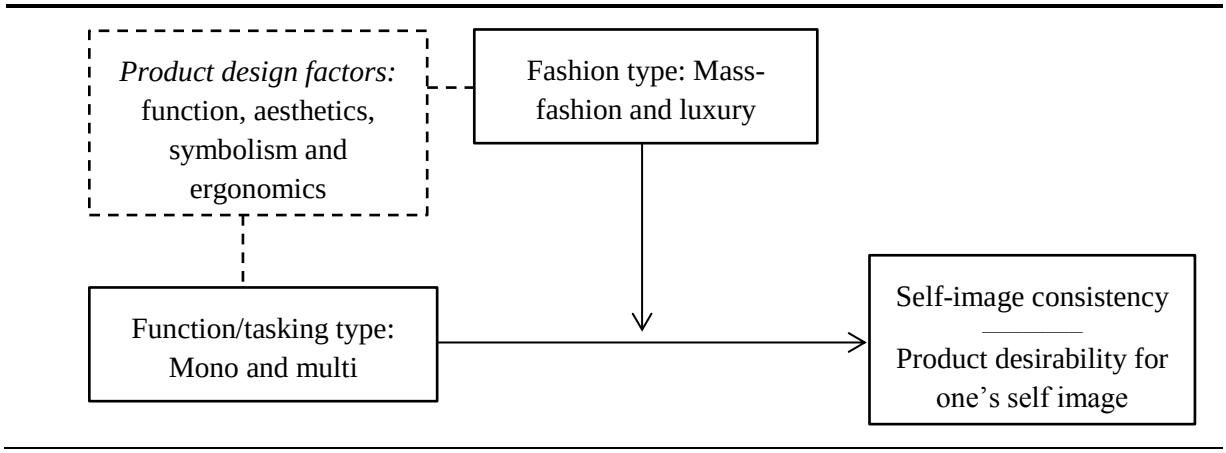


Figure 2
Consistency scores reflecting existing knowledge structures of the evaluated products

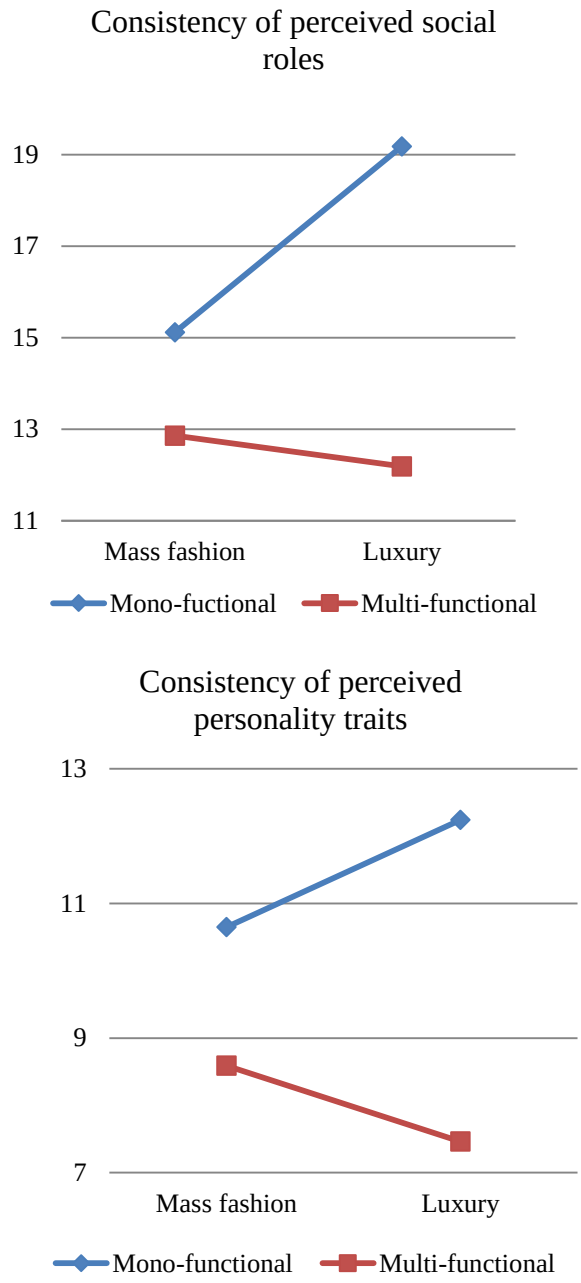
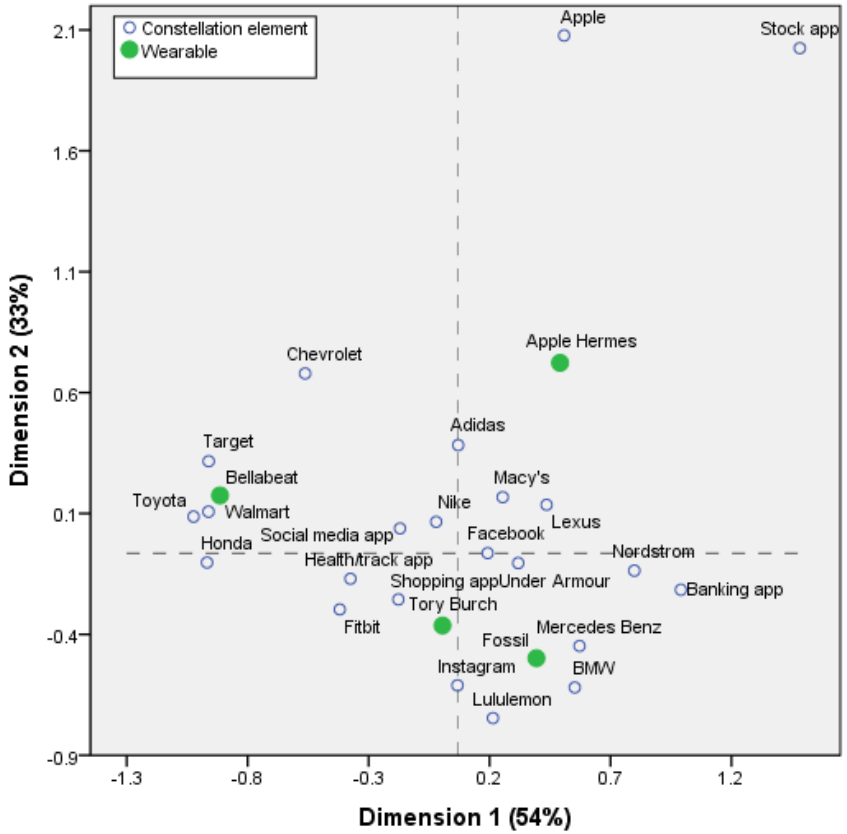
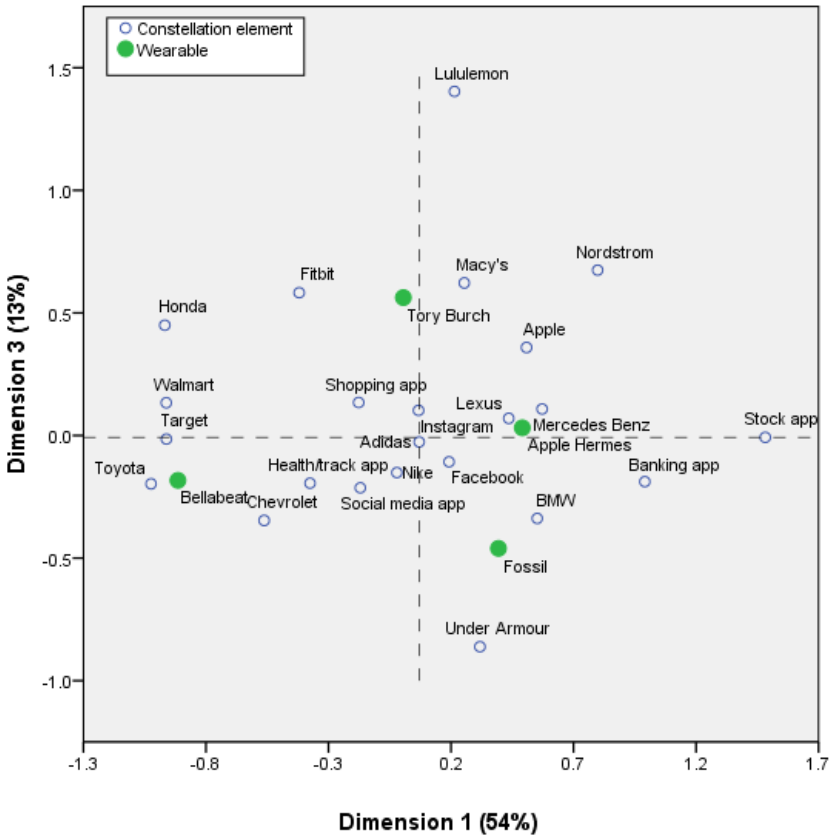


Figure 3
Graphical illustration of correspondence analysis


Constellation element
Wearable
Apple
Stock app
Chevrolet
Apple Hermes
Adidas
Target
Bellabeat
Macy's
Toyota
Walmart
Nike
Lexus
Social media app
Facebook
Honda
Nordstrom
Health/track app
Shopping app
Under Armour
Banking app
Tory Burch
Fitbit
Mercedes Benz
Fossil
Instagram
BMW
Lululemon
2.1
1.6
1.1
0.6
0.1
-0.4
-0.9
-1.3
-0.8
-0.3
0.2
0.7
1.2
Dimension 2 (33%)
Dimension 1 (54%)


Constellation element
Wearable
Lululemon
Nordstrom
Macy's
Fitbit
Honda
Tory Burch
Apple
Walmart
Shopping app
Lexus
Target
Instagram
Mercedes Benz
Stock app
Adidas
Apple Hermes
Toyota
Health/track app
Nike
Facebook
Banking app
Bellabeat
Chevrolet
Social media app
BMW
Fossil
Under Armour
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.3
-0.8
-0.3
0.2
0.7
1.2
1.7
Dimension 3 (13%)
Dimension 1 (54%)