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How do consumers think about hybrid products? Computer wearables have an identity problem

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ABSTRACT

Hybrid products, as exemplified by Apple or Fitbit wearables, claim features of different product categories (i.e., a technology *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 exemplars and utilizing the product design literature, we propose a typology of these hybrids using the dimensions of (1) mono- versus multi-functionality and (2) mass- versus luxury fashion. Apart from being a fashion product, mono-functional wearables support one main technology-enabled function (e.g., an activity tracker), whereas multi-functional wearables support multiple functions (e.g., being a watch, activity tracker and an organizer). To illustrate the optimal positioning strategies for wearables, we show how various permutations of these products impact a consumer's self-image and product desirability.

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 that the dual nature of these emerging hybrid products offers the potential to duplicate the success story of *athleisure* – a highly lucrative new category (as exemplified by the yoga pants that we now see women wearing everywhere) created by combining athletic wear and leisure wear (Marlowe, 2016). However, the results for wearables have been 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 regarding 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 manner in which companies and users categorize products is tremendously important. This assignment 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 (Chaplin & Lowrey, 2010; Englis & Solomon, 1996). Is a rug furniture? Is 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, as well as how they communicate product and brand attributes to appeal to different dimensions of self-concept. Rajagopal and Burnkrant (2009, p. 232) observed that the greatest issue regarding how shoppers categorize hybrids is a "*single category belief*," with consumers assigning a hybrid to an extant category and then evaluating it according to the determinant attributes that they associate with this category. Thus,

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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 to address the identified questions, is still in its early stages. To date, it has primarily focused on 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 is 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 of the misfortunes of some wearable manufacturers (Temple & Winchester, 2017), this hybrid product category was estimated to reach > 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 that 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 that 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; and.
d) how to develop marketing strategies for wearables and potentially other hybrid products from a product design and positioning perspective.

Our research program includes two studies. In Study 1, we examine the differentiating attributes of wearables and identify 4 product categories based upon a typology of: (1) functionality (mono- versus multifunctional 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 and 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; therefore, consumers can potentially assign them to multiple categories (Rajagopal & Burnkrant, 2009). Such products face the challenge of "*a single category belief*," indicating that consumers tend to assign them to a single pre-existing category based upon their assumptions regarding the items that 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 might not compete favorably with the other items that a store displays that might 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 address 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 (Gregan-Paxton et al., 2005; Solomon, 1988).

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 or her iPhone, to his or her 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 see that product as consistent with their daily lives, the tasks that they need to perform, or the social roles that they seek to play (Chaplin & Lowrey, 2010; Englis & Solomon, 1996). Understanding answers to these questions will help retailers and manufacturers of existing hybrids to display these items in places and settings in which consumers quickly build appropriate perceptions that will help the products to appeal to specific market segments.

3. Qualitative study 1

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 this categorization, we must have deeper insights into 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 Strauss 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 that they handle the data (Kumar & Noble, 2016; Strauss & Corbin, 1990). To analyze the data, researchers perform three types of coding: open, axial, and selective. Open coding is the initial step in data analysis, identifying and describing 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 that U.S. consumers currently use (Statista, 2016, 2017). We compiled these online reviews in December 2015. To select the products to review, we followed Kumar and Noble (2016) and examined 37 articles that 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 these magazines for articles with the following keywords: "fashion tech," "wearable technology," and "wearable device." This process yielded 29 distinct wearable products, including activity trackers, smartwatches, and smart clothing.

Table 1 shows all of the qualifying products for which we collected reviews. For a sample of reviews, please see Table 2. 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; and.
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

Table 1
The set of qualifying wearables.

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 and 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 to 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's version should have smooth 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 jewelry	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
"Setup online was easy. I didn't miss a paper manual because the online manual is complete and easy to access."	Setup		
"The battery life is fantastic – 7 days – the filtered notifications mean 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		

negative review, and 5 stars indicate an excellent review. We attempted to assure a good balance of all review types by collecting 10 reviews of each rating type (i.e., 1 star, 2 stars, etc.).

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 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 one of four categories: symbolism, ergonomics, function and aesthetic, with 2 judges and a proportion of inter-judge reliability of 0.75, achieving a PRL index of 0.82).

We started by reading the collected materials and creating summative labels that described different product attributes and their effects 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, coding, and themes in Table 2 below.

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 functions that a device is able to perform; and (2) fashion type of the wearable because both technical and aesthetic dimensions clearly play key roles in consumers' evaluations, and 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; Homburg, Schwemmle, & Kuehnl, 2015; Jindal, Sarangee, Echambadi, & Lee, 2016; Luchs & Swan, 2011). Product function relates to the design characteristics that make a product functional and can increase its performance. Functionality in this sense would traditionally relate to technical performance and the ability to perform and deliver certain tasks, such as activity tracking in cases of wearables. Product form (aesthetics), in contrast, relates to the 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 the aspects of product design that render a product safe and user friendly (Moon, Park, & Kim, 2015). 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 in user experience (UX) (Jindal et al., 2016). Symbolism refers to the image that 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 bases for wearable differentiation. The primary functional theme that we uncovered relates to the number of different tasks that a device is able to perform. We distinguish between the following:

1. Consumers use *mono-functional products* to perform one specific type of activity (regardless of appearance). For example, a purse such as the EmPowered bag, which 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 functions, 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 acts as a music player, connects to a smartphone and functions as a navigation device. Multi-functionality supports various goals, such as productivity, social connectivity, or/and wellbeing.

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 (Hanslin & Rindell, 2014; Liu & Choi, 2009), consumers tend to make simpler distinctions 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 (Hanslin & Rindell, 2014; Liu & Choi, 2009). 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, which 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 expertise of manufacturing (Kim & Kwon, 2017; Tynan, McKechnie, & Chhuon, 2010). Users expect such products to have the highest quality materials and design (e.g., diamonds, gold, silver, stainless steel, and genuine leather), contributing to the uniqueness of the device and minimizing 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 that 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 the materials here is based less on their rarity and more on their 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, these characteristics also affect the perceived symbolism and ergonomics of these products. Because the majority of wearables are highly visible to other people, different consumers wear (or hide) these devices to communicate a desirable public image. They might 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 the 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 emphasize that they want products that are safe and convenient to wear. They seek wearables that will not scratch their bodies and that will be secure when worn so they will not slip off easily. Ease of use is reflected in the availability of comprehensible setup 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 such as Rolex, Hermès and Tiffany, precisely because they sync with the social placement that they occupy and/or desire. Even tech products are not immune to these pressures: Popular wisdom and even some empirical evidence, for example, have pointed to the personality differences that 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 the brand personality and the product's positioning strategy?

To address this issue, we adapt consumption constellation methodology (Englis & Solomon, 1996; Solomon, 1988) to evaluate the consistency of self-images associated with the different types of hybrid products that Study 1 identified. The consumption constellation construct proposes that consumers internally represent social roles in terms of the set of products and services that they associate with the role (this set is the constellation). Prior studies have provided 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 a strong 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 strong consensus regarding their perceptions of the constellation of 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 outcome indicates that knowledge structures in relation to this product are very strong, and we should expect that this 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 (Chaplin & Lowrey, 2010; Lowrey, Englis, Shavitt, & Solomon, 2001)

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 the people who wear them (Gregan-Paxton et al., 2005). For instance, if we consider a Bellabeat bracelet, it is likely that 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, in contrast, 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:

H1. Mono-functional products will exhibit greater 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; thus, they convey high status (Cristini, Kauppinen-Räisänen, Barthod-Prothade, & Woodside, 2017). We tend to assume that owners of luxury products are more likely to be affluent and to appreciate the finer things (Joy, Wang, Chan, Sherry Jr, & Cui, 2014). We propose that these assumptions are likely to dominate consumers' perceptions of hybrid products, which represent the luxury (versus mass fashion) category, and consequently affect their perceptions of the social roles associated with these products.

For mono-functional luxury hybrids, such as the Tory Burch bracelet, the luxury aspect will dominate observers' perceptions and render 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 could 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 greater 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 cases of luxury compared to mass fashion products. Hence, we propose that:

H2. The perceived fashion status of a product (mass fashion versus luxury) will moderate the effect of product functionality on the consistency of self-image associated with a given product in such a manner that the hypothesized difference in consistency between mono- and multi-functional products (H_1) 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 the affecting desirability of being a member of these groups? Englis and Solomon (1995) specified that consumers tend to fall into one of these four groups in regard to their associations with a given social role: occupied, aspired, avoided, and irrelevant. Belk (2013) claimed that contemporary consumers often have multiple selves; hence, they might prefer products that are sufficiently flexible to allow them to convey multiple dimensions of social identity. For example, a cosmopolitan multi-tasker might gravitate toward a smartwatch that is sufficiently versatile to fit well during a yoga class and on a date.

However, would that preference hold for luxury products, for which the exclusivity that we associate with this domain is typically the most dominant aspect? Luxury research has indicated that some people can consume luxury, especially popular luxurious brands, to meet their self-expressive goals and to help them fit with elite aspirational groups (Kastanakis & Balabanis, 2014). In such cases, the symbolism and image conveyed by a product are very important because the product supports status seeking and often leads to "*bandwagon effects*"—shopping patterns by which 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 might 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:

H3. 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 Fig. 1.

5. Methods

5.1. Data collection

To ensure adequate sample size a priori, power analysis was performed using G*Power. Using an alpha of 0.05, for 90% power to detect effects with a medium effect size of Cohen's $F = 0.25$ in a 2×2 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,

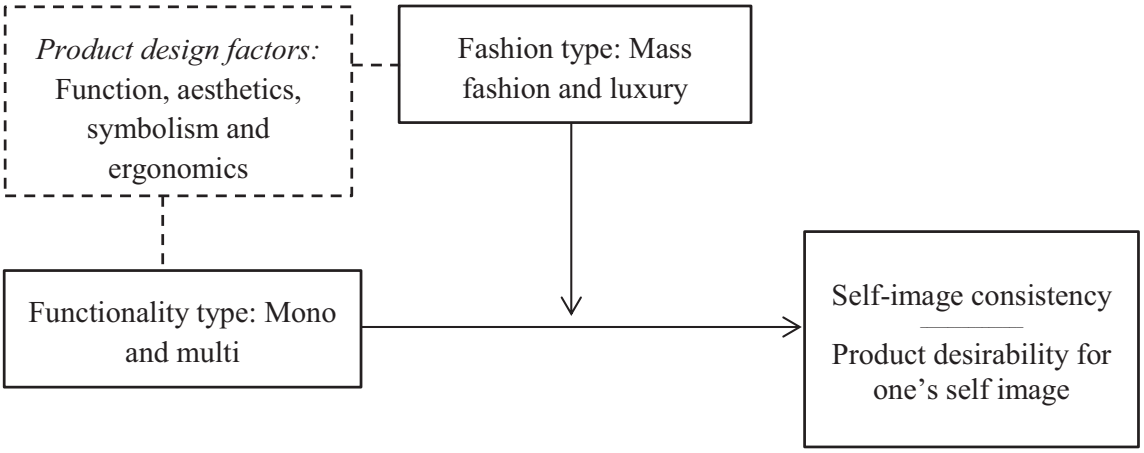

Fig. 1. Proposed conceptual framework.

based on the U.S. population aged 18–75 years old.

The study was a 2 × 2 between groups quasi-experiment with wearable categorization along the: (1) functionality dimension (mono- versus multi-functional); and (2) fashion type dimension (mass- fashion versus luxury). Participants were randomly assigned to respond to 1 of 4 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 since they were the only brands that clearly fall into the luxury category (Cavender & Kincade, 2014; Wang & Griskevicius, 2013). 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 were important to differentiate in the study design.

In the choice of mass fashion brands, we attempted to ensure that the selected brands were on a similar level of familiarity because 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 > 5000 reviews at the time of data collection (Fitbit, Misfit Shine, Samsung). Then, Fossil and Bellabeat were selected since both wearables were the closest fit to our definitions of mono- and multi-functional mass fashion.

The 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. The subjects were first provided with a short description of a social role ("*We sometimes associate certain types of people with the products and brands that they use, as well as with a certain way of living (e.g., the way that 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 his/her spare time hiking or supporting environmental initiatives (e.g., cleaning up polluted areas*"). They were also shown an image with 1 of the 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 the mono- and multi-functionality of the selected products, we asked the 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 indicates limited tech functionality supported by the product, and 100 indicates a wide range of complementary tech functions supported by the product.*" They also answered a question about familiarity with the wearable that 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 were also 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 the option "*Other*" or "*None of these*" was selected, the participants were prompted for further explanations. 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 to better understand the characteristics of different social roles, we showed the participants the definition of social role again and asked them to list the constellation elements for each product owner: his/her preferred leisure/work clothing brands, mobile applications and cars (Englis & Solomon, 1995; Solomon, 1988). After this task, the participants answered the question related to their associations with the social role that 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] To pre-test the questions eliciting constellation elements and to 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 of a large U.S. university (65% female/35% male, average age M = 21, SD = 2.94). The participants were rewarded with a course credit for their participation. In this study, the participants were randomly assigned to one of two wearables representing a combination of mono- and multi-functional mass fashion and luxury: the Tory Burch bracelet and Fossil smartwatch. The procedures that 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 explanations. Based on this additional information provided by 7 respondents, we added 2 additional labels: "*Gym rat*" and "*Trend setter.*"

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:	$R^2 = 0.11$, 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 %[a]								
	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 (0.72)		8.59 (0.71)		12.24 (0.72)		7.46 (0.71)	
Model summary:	$R^2 = 0.05$, 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)							

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

5.2. Results

The sample consisted of 52% male/48% female U.S. adults. The average age of respondents was M = 38 years old (SD = 14.45). The number of subjects exposed to different wearable type is presented in Table 3. There were no associations between the dependent variable and the age or gender of the respondents.

Then, we compared the 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 = −0.13; SD = 1.03) than Fossil and Apple Hermes smartwatch (M = 0.13; SD = 0.96, 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 to be the most familiar (M = 0.11, SD = 1.06), followed by Fossil (M = 0.02, SD = 0.92), Hermès Apple Watch (M = −0.02, SD = 1.01) and Bellabeat (M = −0.12, 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 were divided by the total number of labels listed. This process resulted in consistency scores ranging 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 PROCESS software (Hayes, 2013). Following the recommendations for main effects parameterization (Hayes, 2013, p. 277), we used dummy codes for function (−0.50 multi-functional; 0.50 mono-functional) and fashion (−0.50 mass fashion; 0.50 luxury fashion).

To test H_1 and H_2, we used 2 separate measures that differed in elicitation techniques: (1) labels describing social roles selected from the preexisting label list; and (2) personality characteristics freely listed by participants (results are summarized in Table 3 and Fig. 2).

H_1 is supported because, 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 mono-functional wearables ($M_{SocialRole} = 19.80$; $M_{PersonalityType} = 12.24$) than it is for multi-functional wearables ($M_{SocialRole} = 12.19$; $M_{PersonalityType} = 7.46$; $\beta_{SocialRole} = 7.61$, 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; $\beta_{PersonalityType} = 2.05$, t(554) = 2.05, $p = .040$, 95% CI = 0.09–4.02). The interaction effects for both measures are illustrated in Fig. 2.

To address H_3, we examined 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 that 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

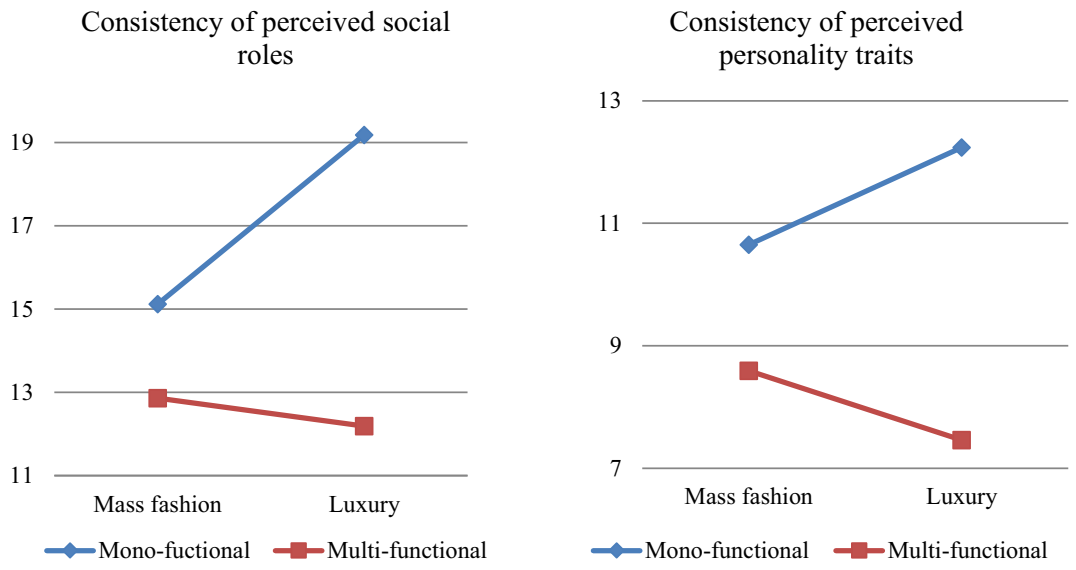

Fig. 2. Consistency scores reflecting existing knowledge structures of the evaluated products.

and individual association in relation to a given group/social role.

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* = 0.71, z = 1.78, *p* = *.075*, 95% CI = −0.07–1.51) mono-functional luxury (*Estimate* = 0.90, z = 2.14, *p* = *.033*, 95% CI = 0.07–1.73) and mono-functional mass fashion (*Estimate* = 1.15, z = 2.07, *p* = *.038*, 95% CI = 0.06–2.23).

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 the 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 for the understanding of the relationship between constellation element and each wearable. CA is a method of analyzing associations between the 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 the respondents who evaluated that product. To build a contingency table needed for CA, we calculated frequencies for all of the constellation elements 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 gray in Table 5.

The 4 × 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, Black, Babin, & Anderson, 2008, p. 603), thus representing 100% of the variance. A two-dimensional solution was considered first because it explained 87% of the variance, a satisfactory result. We opted for the 3-dimensional solution because it was easier to understand and explain than the 2-dimensional solution, and it provided more insights in relation to the evaluated wearables, as illustrated in Fig. 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] = 0.673), Apple Hermes (CTI = 0.199) and Fossil (CTI = 0.128) wearables with Toyota (CTI = 0.133), banking app (CTI = 0.130), Honda (CTI = 0.095) and stock app (CTI = 0.089). Interestingly, as Fig. 3 illustrates, Bellabeat, Fossil and Apple Hermes are on the opposite sides of 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 = 0.553) and Fossil (CTI = 0.264) with Apple store (CTI = 0.399), stock apps

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*
The groups 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, Cramer's V = 0.13, 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.

(CTI = 0.212) and BMW cars (CTI = 0.092). The third dimension (explaining 13% of variance, points to perceived fitness abilities/purpose of wearables) groups Tory Burch (CTI = 0.582) and Fossil (CTI = 0.361) with Under Armour (CTI = 0.238), Lululemon (CTI = 0.234), Nordstrom (CTI = 0.092), and Fitbit (CTI = 0.68). 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.

6. Discussion

6.1. 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 the product design

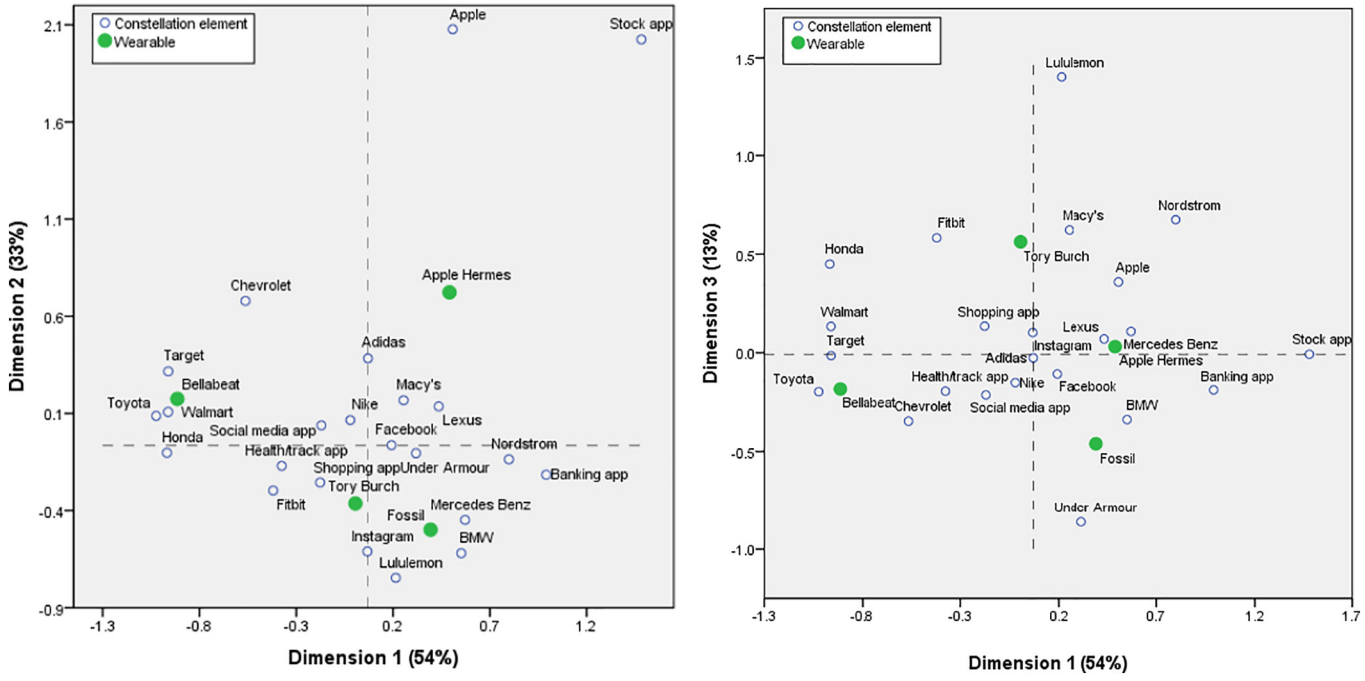

Fig. 3. Graphical illustration of correspondence analysis.

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 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 mono-/multi-functionality, aesthetics, symbolism and ergonomics), thus extending the existing literature, which has focused on some (but not all) of these characteristics in relation to considered products. Jindal et al. (2016), for instance, considered aesthetic, functional and ergonomic dimensions only, while Homburg et al. (2015) considered aesthetic, functional and symbolic characteristics. Researchers in the future might need to consider that different product types will be differentiated by and desired for different sets 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 might diminish the status appeal of their products when they add the additional functionality that many consumers seem to desire. As these hybrid products morph into multi-functional tech platforms, they could lose the capacity to signal uniqueness, craftsmanship and style, which consumers typically associate with luxury. Consequently, while multi-functional luxury could appear as a new product category that could help some consumers to detach luxury 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 the identity and values that buyers typically associate with luxury (Friedman, 2018).

6.2. Managerial implications

Considering the opportunities and challenges associated with the marketing of wearables, as well as the 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 these 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 the 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. These companies could identify other tech functions that could be embedded in their products and manufacture separate mono-functional products that deliver each function. For instance, these companies could attempt to understand their consumers better and determine 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 to track basal temperature (pointing to the time when couples should seek/avoid intimate relations, depending on their objectives; see Caddy, 2018) through an ear insert? Considering that fashion consumers tend to have multiple products within the same product category (e.g., bags, belts, earrings or shoes), it could be a good way of launching other mono-functional luxury products. These products are still likely to communicate the uniqueness associated with luxury because 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. These companies could also aim to identify various tech functions and manufacture various separate mono-functional products delivering these different functions. Multi-functional mass fashion products, while generally desirable, could consider expanding the areas of multi-functionality following the suggestions for mono-functional products (and ensuring that this functionality is emphasized using 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 could render 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 sections of the stores, 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); thus, they expect to see these products in different stores and not only the most exclusive ones. However, these principles would less likely be effective for multi-functional luxury, such as Apple Hermès. Before more research emerges about those products, the safest approach is most likely 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 could also help marketers to identify optimal co-branding alliances, a common strategy used by companies to respond to the rapidly changing marketplace (Shen, Choi, & Chow, 2017; Voss & Mohan, 2016). For instance, Fossil and Under Amour could launch a special line of accessories that would use technology enabled by sensors embedded in the textiles. These companies could also develop a new edition of a smartwatch that would target both stylish and active consumers. Therefore, this methodology provides insights for marketers on the right partners to consider. Again, these principles would not apply to multi-functional luxury products.

6.3. Limitations and future research

While our analyses aim to address hybrid products in general, we focused on a small sample of wearable products available at the time of data collection; therefore, future research should examine 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 that new hybrid products are constantly appearing on the market, future research could examine the characteristics of such new products, as well as those outside of the American market.

A natural extension of this work would be the evaluation of consumer behavior (e.g., purchase or adoption intention) in relation to different hybrid categories. The product characteristics that this paper describes (mono- and multi-functionality, 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. The results of such studies could inform mass fashion and luxury designers interested in hybrids about 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) and 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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